ME 1 NUMBER 9 SEPTEMBER 1994

# OS/2 MAGAZINE

## Test Drives

## EZRAID Disk Protection

## WordPerfect 6.0A's OS/2 Integration Tools

## 76 TIPS

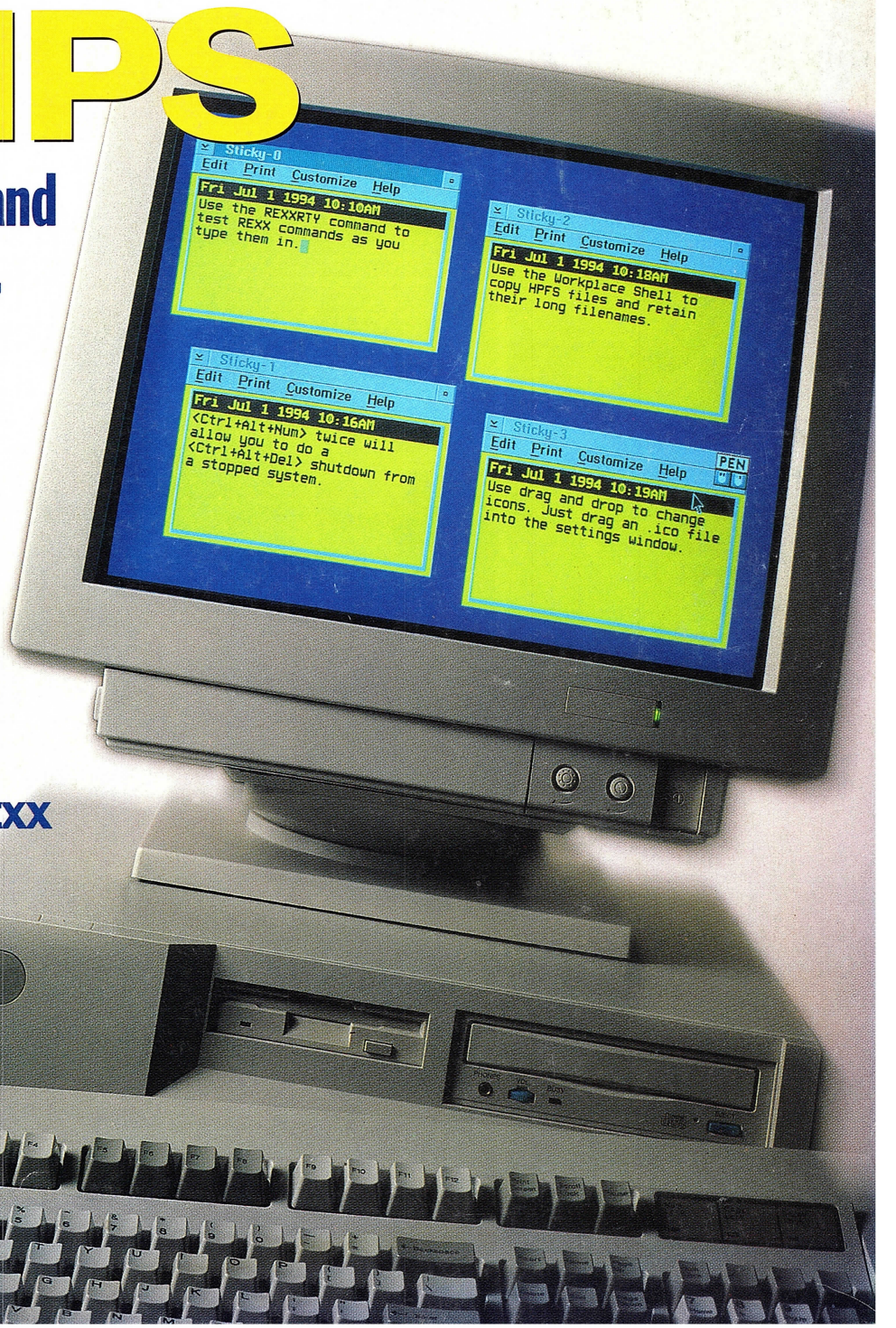
### Tricks, Shortcuts, and one-liners for WPS, Configuration, and Devices

### Audio Demystified

**What you need to know about sound boards under OS/2**

### REXX Goes GUI

**Reviewed: GpfREXX, VisPro/REXX, and VX/REXX**

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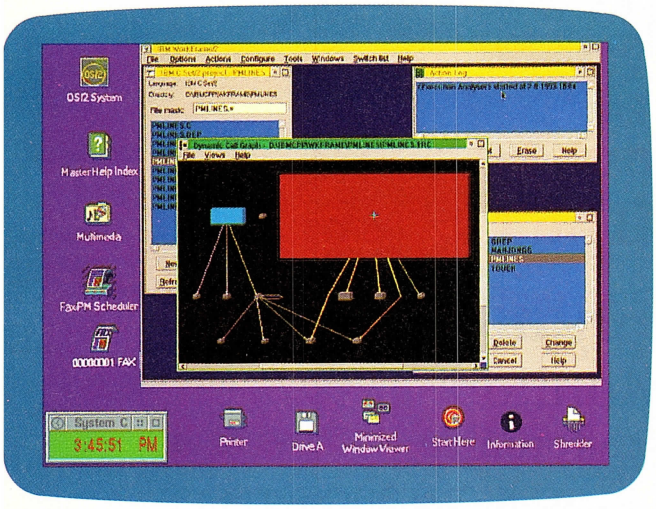


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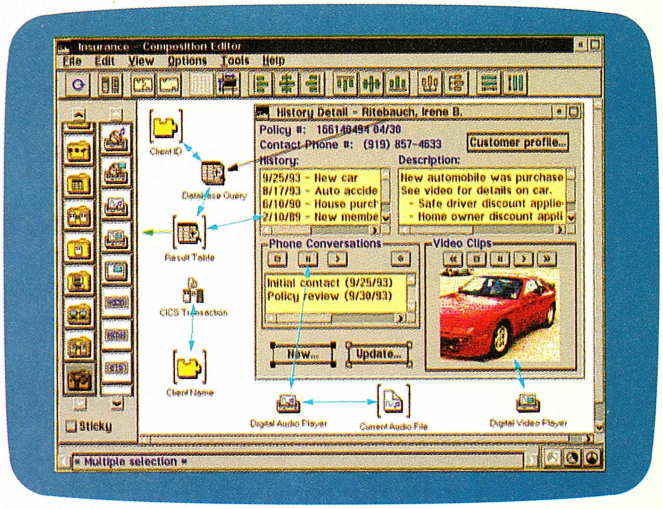


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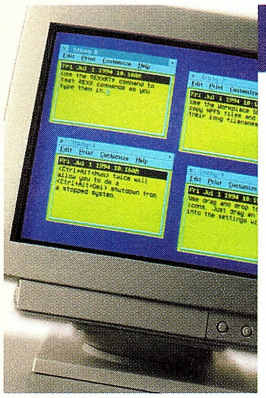

## Cover Story

**24 76 Tips: Get Your Shortcuts Here!**

You wouldn't leave your drill bits lying around, would you? No, you'd put 'em back in your handy drill-bit case. The same goes for OS/2 tips, tricks, shortcuts, one-liners, and secrets: if you leave 'em lying around, you'll never find the right one when you need it. So, in the spirit of Snap-On Tools, *OS/2 Magazine* is proud to offer its first collection of tips, 76 strong, covering the Workplace Shell, Configuration, and Devices. *Edited by Alexander Antoniades, with contributions by David Moskowitz, David Reich, Lenny Bailes, Rick Meigs, and Matt Hickman.*

## Features

**37 Audio Demystified**

IBM touts OS/2 as a multimedia operating system, and even includes extensions, called MMPM/2, to help your Workplace Shell make entertaining sounds and display smooth motion pictures. But if you're like most OS/2 users, you'll need to buy a sound board in order to make OS/2's audio support work. Here's a discussion of the major boards, the main characteristics, and their OS/2 compatibility. *By Linden DeCarmo*

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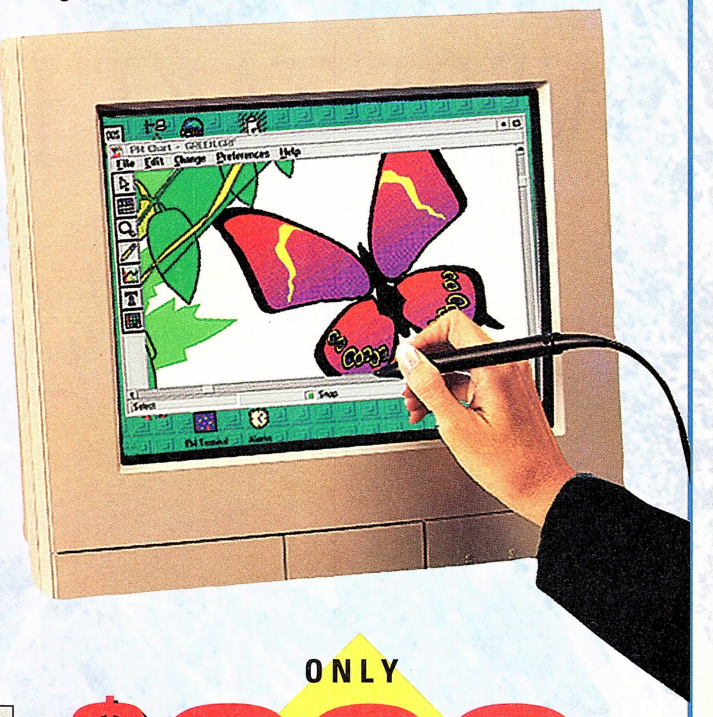

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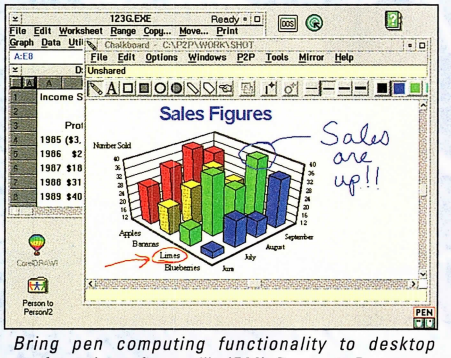


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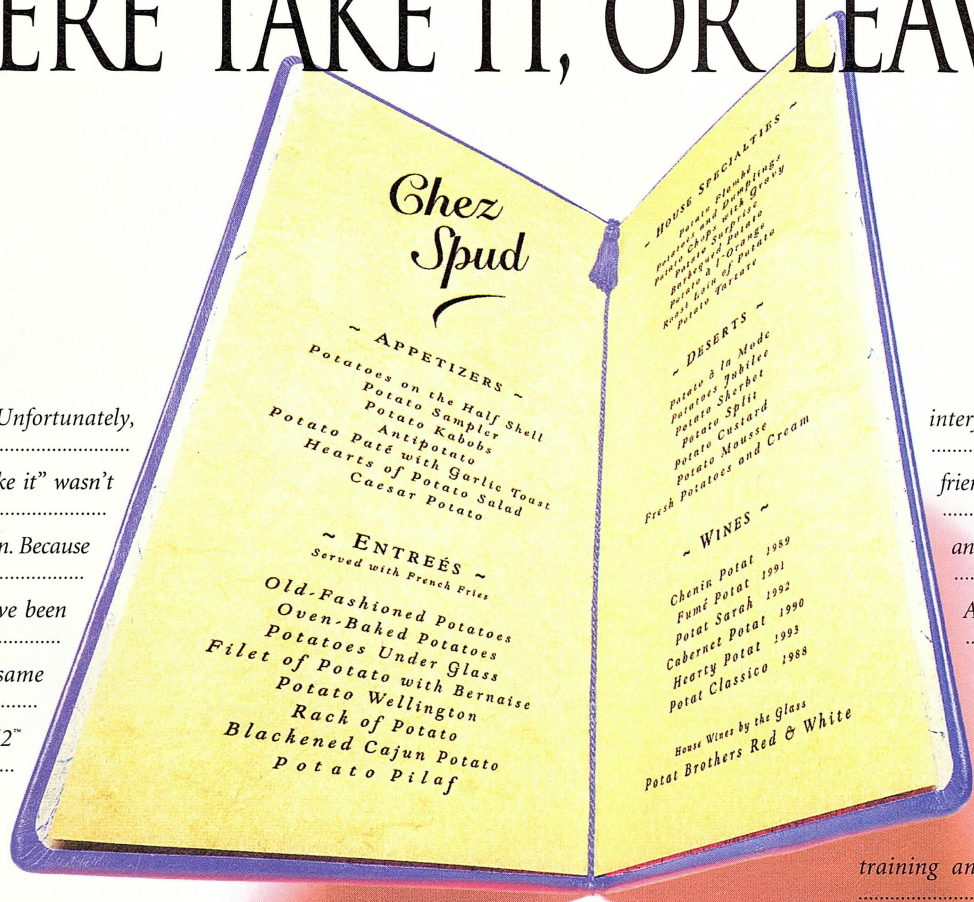


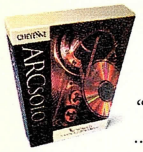


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# Perspectives

## The 15-Minute CD-ROM

Over the July 4th weekend, I helped a friend install one of those inexpensive multimedia upgrade kits. You've seen them in the computer superstores: double-speed CD-ROM drive, 16-bit sound board, and a half-dozen discs, all for about $300. It was a good price, and surprisingly easy to install. We got her system up and running in less than an hour, including finding screws (not included!) to mount the CD-ROM drive in the mini-tower case.

But what's a multimedia upgrade without multimedia? We scrounged an eclectic collection of consumer CD-ROMs, and decided to check them out: Grolier's encyclopedia, Microsoft's Cinemania movie reference, Metatec's Nautilus magazine-on-a-disc, "Heart—20 Years of Rock & Roll," a Karaoke library, and others too odd to mention. Nearly all worked like a charm. A few were even worth playing with for more than five minutes. Actually, about 15 minutes seemed the average life expectancy of these discs.

All of the consumer multimedia titles were Windows-based; we couldn't put our hands on a single recreational OS/2 CD-ROM. There *are*, of course, OS/2 shareware file collections, like Walnut Creek's Hobbes CD-ROM, but our mission was to find fun multimedia discs, with lights, cameras, action.

So, what's the problem? The mess that these CD-ROMs left behind! Most of the CD-ROMs I've used in the past—such as developer discs from IBM, Microsoft, and Apple—run directly from the CD-ROM drive. Not so with these multimedia discs. Nearly all copied megabytes to the hard disk, installing not only executables, but also dozens of untraceable device drivers, fonts, and DLLs in various system directories.

Can you believe that one disc installed runtime libraries for *all three* versions of Visual BASIC: *vbrun100.dll*, *vbrun200.dll*, and *vbrun300.dll?* That's more than 1MB right there! Another disc copied both Video for Windows and QuickTime for Windows. Still another left me with the Asymetrix Toolbook runtime. What's the extent of the damage? Here are some examples: Cinemania, 1.1MB; Grolier, .8MB; a child's sing-along disc, 1.8MB. And that's just in their own directories. I don't know how many megabytes of *.drv* and *.dll* files were copied to the *\windows\system* directory, but it's now weighing in at a hefty 22MB.

After the fun was over, it was time to clean up the mess. Deleting the named directories was easy. Finding the *.dll and .drv* files hiding in the *\windows* tree was hard. We started poring through the myriad of *.ini* files attempting to identify files that we could safely delete. After about an hour of trying to list unneeded files, we gave up in despair. (Why do programmers insist on giving DLLs the most cryptic names? What should one make of *msajt110.dll* or *mvftsui2.dll*?)

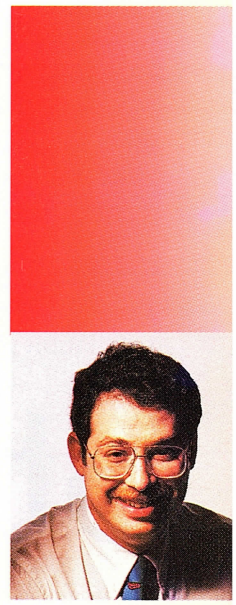
In other words, my friend will be living with the consequences of those 15-minute CD-ROMs for the foreseeable future.

The situation we encountered is simply unacceptable. It's bad enough for a CD-ROM to copy a few *.ini* files to someone's hard disk. But don't permanently modify system directories. Most of these discs' *setup.exe* routines didn't ask permission before hacking. And, not one of these discs offered advice, tools, or documentation for removing the product.

This isn't an OS/2 problem, or even a Windows problem. It's an attitude problem, and as more discs begin to arrive in the OS/2 community, we consumers need to set clear guidelines for multimedia developers:

- You have 650MB, more or less, of cheap space on the CD-ROM. Don't copy *anything* to our smaller and more expensive hard disk that's not absolutely necessary! If running executables, libraries, or images from a faster hard drive will speed performance, make that a user option, not a default behavior. Realize that we might not have huge hard drives, or want to waste primary storage space on your product.
- If you must install files on our hard disk, put them in a clearly named directory. Don't put things into any other directories. Write a complete installation log, with manual file-removable instructions.
- Put an *uninstal.exe, unsetup.cmd,* or *removeme.bat* file right in the root directory of the CD-ROM. Make it smart enough to repair *all* the damage created by your installation program. The best way to do that, of course, is not to do any damage in the first place.

In other words, don't assume that we will never want to remove your product—we will, sooner or later. The more painless you make the process, the more likely we are to buy your *next* product. (How's that for motivation?)



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# Letters

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### Who needs WordPerfect when you have EPM

Dear Editor:

Steve Gallagher's article, "A secret guide to The Enhanced Editor" (July 1994, pp. 23-29) left out one of the best features that can be added to EPM. A file exists on *ftp.cdrom.com* in */pub/os2/2_x* called *epm_spel.zip*, which, when added to the system, gives EPM a full-featured spell checker. According to the text file, IBM left this feature out of the 2.0 and above releases of OS/2. I do hope they decide to re-include it in future versions; it makes EPM great for short memos or personal letters, when a full-featured word processor is just too much.

Bill West
via the Internet.

### Contacting companies from the Internet

Dear Editor:

I read, with great interest, Brian Proffit's report on QwikSwitch and Amos(July 1994, pp. 19-21). Unfortunately, no Internet address, phone number, or fax numbers were given for either company. I do not have access to the networks mentioned and would like to obtain the software sooner than I would by sending U.S. mail to the authors. By the way, I did try the OS/2 Internet archive *ftpos2.cdrom.com*, but could only find version 1.01 of Amos, not 1.2, which you reported on.

Peter Stein
via the Internet

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### REXX column error

Dear Editor:

Alex Lane's REXX column, "Never Completely Hopeless" (July 1994, pp. 59-61) has a major error in the sample code. The statement:

```
if date >= "8/1/93" & date
<= "8/31/93" then do
```

will match a lot more dates than just those in August of 1993. It will, for example, match August 2 through 31 of any year prior to 1993. A direct string compare of dates will only work for certain date formats. This problem would occur with any programming language—not just in REXX.

In addition, the sample code had some uses that, although correct, are questionable. For example, while the name, **file** will initially refer to the value **FILE**, it may lead to an error if the program is later changed to use **file** as a variable name.

Shmuel (Seymour J.) Metz
via CompuServe

### Perspectives on Perspectives

Dear Editor:

Alan Zeichick's comments (July 1994, pp. 7-9) about IBM's view that "small office/home office" users are unsophisticated and less demanding than corporate users are key to understanding the errors in judgment by IBM when approaching the general market against Microsoft. In my experience, the small and individual power user really puts the system through its paces. The corporate environment is quite gentle by comparison. I know of a corporation that has about 10,000 PCs running OS/2. All the PCs have the same three or four applications, plus a custom client-server application. Any bugs have long been fixed and the users have been trained to use this specific software. Everything works fine in the small portion of the OS/2 system being used.

The corporate environment masks many potential problems in the operating system. Put it on a home machine with all types of shareware and applications from everywhere run by an owner who does not have instant access to factory fixes and who will try everything—now that's testing the system!

By in large, IBM ignores the problems of these small players who are actually wringing out the system for them. Until they take these little guys seriously, they won't have a product that will sell well at the Eggheads of the world. Let's hope the changes Lou Gertsner is implementing will affect some of the thinking at IBM.

James G. Robertson
via the Internet

## Server/Client computing under X Windows

Dear Editor:

Rick Cook's excellent article, "X Windows on the Desktop" (June 1994, pp. 30-39) explained the confusion regarding X Window's use of the terms Client and Server.

I never understood before why people feel these terms are reversed when, in fact, their use is perfectly accurate. The problem, apparently, is that people have a mental client/server image that places the client physically near the user.

Physical location, however, has nothing to do with it. The client/server relationship exists independent of geography. A server is simply a program that funnels requests from multiple clients to a shared resource.

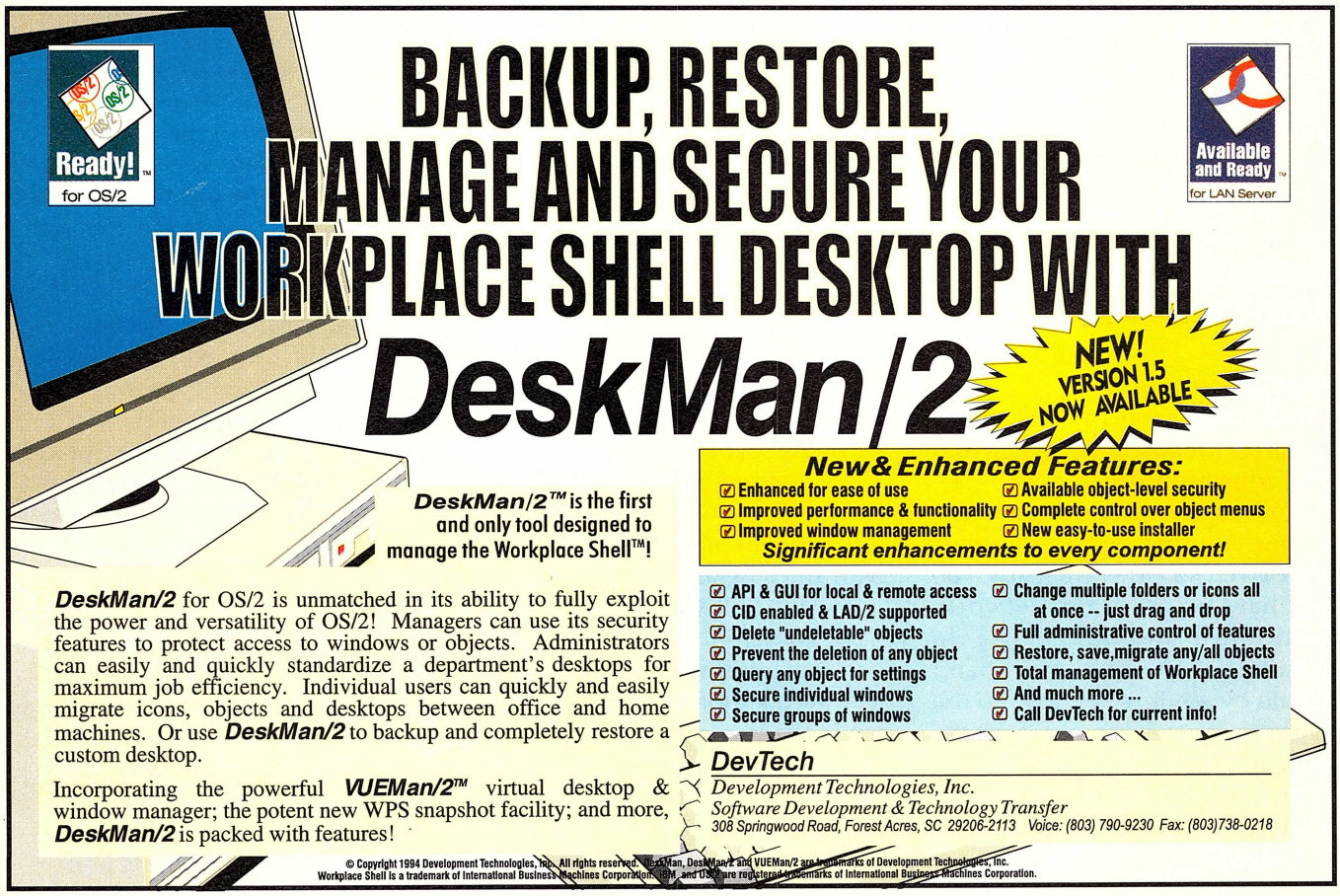
**The X Windows world uses the terms Client and Server in the same way that the rest of the universe does.**

A good example would be a database server. It is common for hundreds of users to read and write records in one database. Without the benefit of a server, those transactions would get interleaved incorrectly. The server coordinates demands made on the shared resource, (the database, for example).

The same is true of the X Server. If multiple programs (clients) want to draw various objects (a clock and a calculator, for example) on one screen without sending those drawing commands through a server, the clock's hour hand might be incorrectly attached to the calculator's square-root key. There has to be a server that, in a sense, *owns* the screen, just as a database server that owns the database must exist.

The X Windows world uses the terms Client and Server in the same manner that the rest of the universe does.

Ken Wolf
via the Internet

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# This Time it's Personal

## OS/2 WARPS INTO THE MASS MARKET

BY ALEXANDER ANTONIADES

During the past couple of months, it's been hard to figure out what IBM's OS/2 Team has been up to. In fairness to industry observers like myself, it's never easy anyway. Part of the confusion was caused by the numerous reports of what the next version of OS/2 would be like. First, one report would come out about a SOM-compliant Workplace Shell and then another report of rewritten applets. Other rumors also surfaced that integrated networking, multiple input queues, Win32s support, Mwave integration, and even a multithreaded boot loader were to be added. Sometimes these rumors would contradict what was said before, and some sources would deny what other sources had reported.

The smoke cleared one day when I got a telephone call from an IBM representative who officially told me the "truth." The reason all of the stories conflicted was that the main (single Intel-based CPU) OS/2 family was being split into two separate versions. The first version, dubbed OS/2 Personal (which is due to be released by mid-to-late 1994), has been mentioned by numerous OS/2 officials (see "Dateline: OS/2," April 1994, p. 11), and is aimed at the home market. Another version, sporting the code name OS/2 Enterprise, aimed at the high-end business market, is due to be released sometime in 1995.

With this conversation in mind, I looked at the OS/2 Performance Beta Version 2.99 Special Edition for Windows. Beta 1 shipped in mid-June with rumors that Beta 2 would be released by the end of July, with a final ship-date designated only as "late summer," or "before COMDEX." This version is the one that IBMers have been referring to as OS/2 Personal or Warp.

The changes made to this version are obvious from the first time you see them—it's the little things. For example, the OS/2 logo is now animated during bootup, most of the standard OS/2 objects have new icons, and scheme and palette management have been revamped. Another noticeable item is the speed. Bootup, which still takes longer than DOS/Windows, is noticeably faster. The boost in overall performance is noticeable on a general OS/2 system (a 486 or higher with at least 8MB of RAM) but it is very noticeable for low-end systems (a 386 with 4-to-8MB of RAM). A fastload option for Win-OS/2, which allows automatic loading of the Windows subsystem at all times to improve Win-OS/2 startup time, is a welcome addition.

Under the hood, the main changes were reportedly made in a few key areas. The kernel itself has been rewritten and the debugging code removed. The 16-bit PMWIN calls have been rewritten to 32-bit, so the display doesn't thunk between the 32-bit graphics engine and 32-bit video drivers. Other areas, such as MMPM/2 and the bootup sequence, have been optimized, but device drivers seem largely unchanged. IBM has said that the Performance Beta's code base is equivalent to the OS/2 2.11 Service Pak level, so bugs fixed in that release should stay fixed in unchanged areas of the code.

The beta seems stable overall and is usable for everyday work, with the exception of communications programs. Understandably, bugs exist, but most programs will run.

### The Good

The good part is that IBM is trying to access three major markets that OS/2 has had trouble with: the home, the laptop, and the OEM-bundle deals—which explains the 4MB performance target. For the OEM bundle market, 4MB is the minimum system configuration that most vendors ship. Also, it would ease OS/2's acceptance by the channel if OEMs could ship computers with OS/2 without paying for the Win-OS/2 license and have acceptable performance levels with the base configuration. IBM is making a greater effort to encourage development of games and other OS/2 multimedia titles to encourage acceptance in the home market. Features that aren't in this beta, but are scheduled for

the final product, include a single-click installation process and a revamped OS/2 tutorial. Play-at-Will (IBM's version of Plug-and-Play technology) will also be included in this release.

### The Bad

First of all, the version currently in beta is OS/2 for Windows, which means that users of the regular version of OS/2 have to re-install, not upgrade, if they want to use it. It's unclear when or what to expect in a standard version (with Win-OS/2 included) of OS/2 using these enhancements, but it looks like we won't see it before the end of this year.

Adding to the bad news is OS/2's reliance on Windows 3.1 code for Win-OS/2 emulation. The current beta still won't install over Windows 3.11 or Windows for Workgroups 3.11. If IBM intends to make the leading-edge version of OS/2 dependent on Microsoft's latest version of Windows, they need to react faster to changes in new versions of Windows. This release is the third chance they've had (including the OS/2 for Windows Service Pak, and Service Pak beta) and they haven't corrected the problem. If IBM can't adapt to small changes, like Windows 3.11, how long will it take them to adapt to Chicago (Windows 4.0) and the various fixes that are applied to it?

### The Ugly

Mah Jongg, which originally appeared in the first version of OS/2 2.1, is still not included in the installation routine. These performance enhancements are great, but why weren't they done a long time ago? For a "32-bit" operating system, IBM is replacing quite a few 16-bit parts. IBM will probably call this OS/2 3.0, but based on its changes from 2.11, it really should be called OS/2 2.2. Oh well, considering what's happening with version numbers these days, I guess all we can hope for is that it won't be called version 5.0.

### The Beta

By the time you read this, Beta 2 should already be out. The OS/2 performance beta is available on CD-ROM from IBM or electronically from CompuServe or IBM's Talklink network.

The CD-ROM from IBM costs $14.95, and is available by calling (800) 251-2177 between 8:00 am and 5:00 pm, EST.

The 21 disk images are available from the following sources: on IBM's Talklink OS2BBS, download the package named OS2-PERF1; and on CompuServe, the beta is available in the IBM OS2 FORUM Library (GO OS2BETA), just select the OS/2 Performance Beta from the menu.

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# The Objectification of Nearly Everything

## OBJECTS ARE EVERYWHERE, SO WHAT ARE YOU WAITING FOR?

BY AMY D. WOHL

Hold on to your metaphors, folks, the way we develop and use software, or even think about it, is in the midst of change. Objects are everywhere. We are in that confusing middle transitional period when it's too late to change our minds and forget about the whole thing and too soon to be sure it's actually going to work.

### This is the view from 50,000 feet

Object-oriented operating systems aren't a new idea, but getting them into the mainstream and accepted broadly is. In the past, bright minds from the computer science labs and academia built object-oriented operating systems, languages, and even a few applications, but they were generally arcane, difficult to understand, and ill-communicated to the rest of the information systems world. This fact has allowed us to praise the concept but largely ignore its execution. That day, however, is drawing to a close.

Many systems designers, programmers, and IS managers trained in traditional programming languages and methodologies don't yet understand object-oriented tools and techniques. In fact, many of them are outright terrified of them, seeing in this change a challenge to their competence, their control of information, and their livelihoods. We've had IS vice presidents tell us they're glad they'll be able to retire before they have to implement object orientation (OO). Others waste time they could better spend in transforming their skills, arguing that OO is just a passing fancy, no better than past or present tools.

**Object-oriented operating systems aren't a new idea, but getting them into the mainstream and accepted broadly is.**

Religious wars are being fought to determine who is the holiest in OO. These wars will be very much like the relational database wars of the 1970s and early 1980s, presided over by the Codd-Date Rules. The idea will be much the same. In OO we will establish a set of essentially impossible standards that no one will meet and we will endlessly argue about who comes closest and what the acceptable compromises might be. Competitors, developers, and power users will stay up all night comparing trade-offs in sub-classing to determine whether or not the OO environment of your choice supports polymorphism, ignoring the fact that these are apple-and-orange comparisons that can't yield a tasty fruit salad.

In the meantime, commercial software developers have begun to understand what the shouting's all about. In recent months, we've talked to developers at companies like IBM, Borland, Lotus, and WordPerfect, and it's very clear why developers are increasingly moving toward object-oriented programming:

- OO can decrease the amount of time it takes to create and revise programs, but it won't decrease the time it takes to write a first OO program. In fact, Borland's been killing itself trying to get the first OO version of dBase out the door—because the initial investment in OO is steep. They're traveling up several learning curves at once.

  Developers are probably retraining their programming staff and working much more intensively with their business staff, so they need training, too.

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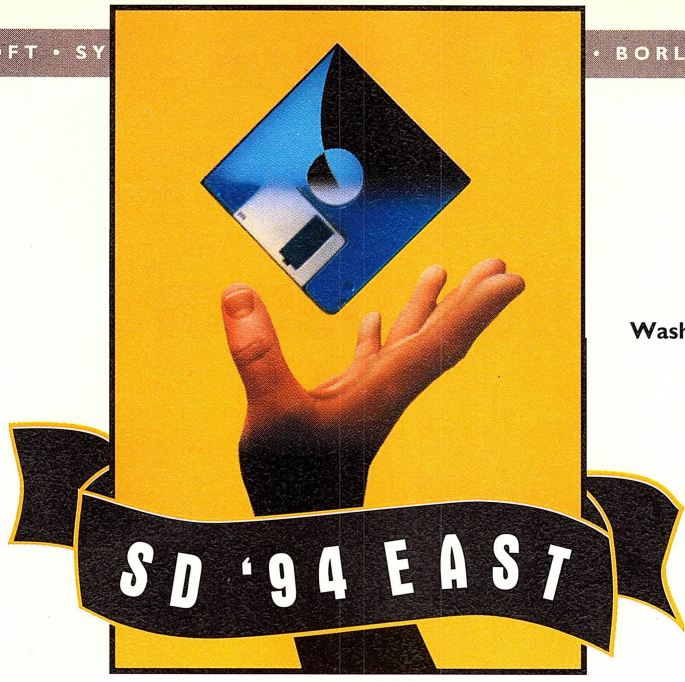


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Programmers have to create the code for what will become the reusable code for later efforts. In the future, more of these class libraries will likely be available commercially, for both generic applications and specific vertical tasks, but right now, much of it, especially the parts specific to a business, will need to be written for the first time.

- OO can significantly increase the participation of non-programmers developing software because the environment offers tools that can be used by non-programmers and provides tools that support collaboration between professionals who understand business problems and their solutions and programmers who can translate these business issues into the language of the computer.

  In the past, discussions have been limited to specification writing and reviews of prototypes and software, which have been costly and time-consuming, often leading to investment in software which, by the time it's ready, solves problems that no longer exist—or have changed so much as to render the software worthless. Now, with the use of prototyping tools and environments and the rapid building of software from reusable components, customers should see results quickly.
- OO software development techniques can greatly increase the flexibility available for managing business systems in a dynamic environment—which means the business and its managers can quickly react to change by reorganizing or by building whole new businesses and the systems to support them.

Where does OS/2 fit in? Object orientation can be achieved at many levels. Some day soon, a mainstream operating system will be created that will be object-oriented—completely or at some lesser level. OS/2, for example, will be offered as an object-oriented operating system on top of the Taligent micro kernel. Before that happens, however, elements of object-oriented componentry will be injected into OS/2 (rather like building up an athlete with vitamins and a healthy diet).

Development environments are using object-oriented tools to ease and speed the development task, as well as to improve the results for the user. Many of these new development tools are available for the OS/2 environment. Checking the IBM booth at the conference you attend or looking through an OS/2 product catalog may surprise you. Computer Associates and Lotus Development, for example, offer most of their tools (and applications) on the OS/2 platform.

Applications are oufitting themselves with OO components and, as we mentioned earlier, some applications are coming onto the market that are OO-built from the ground up. The best of these offerings will expose their OO components to the in-house developer and power user, permitting them to select objects to be combined into custom applications of their own, or to enhance the generic object with custom code. Again, OS/2 application developers (and in-house developers as well) are beginning to follow this route, and we are looking forward to reporting early and often on the results.

---

*Amy D. Wohl is president of Wohl Associates, a consulting firm specializing in office information systems, personal computing, and end-user computing. She is also editor of the* Trendsletter, *a monthly newsletter on computer industry trends.*

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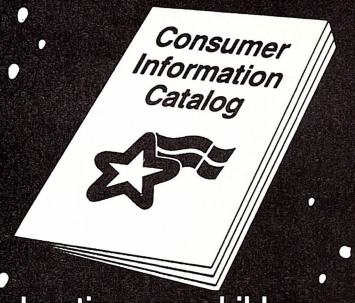


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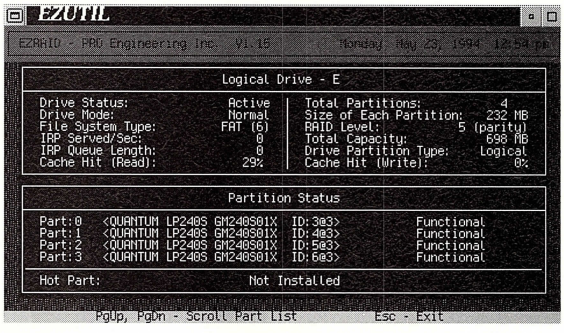
# Raiding WordPerfect

## EZRAID AND WORDPERFECT 6.0A

BY BRIAN PROFFIT

### EZRAID for OS/2




Over the last couple of years, a new technology has received much attention; Redundant Arrays of Inexpensive Disks (RAID) are a way of addressing some data storage problems in computing. People are becoming more and more dependent on their information technology. If their systems are unavailable for even a few minutes, it can cost millions of dollars. One detailed customer database can take up a gigabyte of disk space, which may be more than the space available on any single drive. As people become more dependent on greater amounts of information, input/output (I/O) performance to retrieve that data becomes more critical—particularly in networked environments where several people may be trying to access the same server. RAID, in its half-dozen flavors, has ways of addressing all of these problems with systems that have more than one physical disk drive. And while RAID is typically implemented as a hardware bundle with multiple disk drives, EZRAID allows OS/2 users to set up RAID arrays with any disk drives they already have. It also gives them the ability to mix IDE and SCSI drives.

#### Speeding up your existing disks

I'll try to keep this product review from becoming a RAID tutorial, but because the technology isn't widely used yet, some background may be necessary. The configuration of RAID arrays is determined by the RAID level being used. Six levels exist, each with a slightly different purpose. Level zero is a performance-enhancement technique known as data striping. By using this method, parts of two or more physical disks are configured as the same logical drive, which means only one drive letter is used. When a program writes data to the logical drive, the RAID software splits the data up, writing part of it to each of the physical drives in the level-zero array.

The overlapped I/O brings a noticeable speed benefit with the addition of even a single drive. Further benefits can be gained by adding a third or fourth drive. Based on the speed of your processor and disk drives, you may reach a point of diminishing returns at anywhere from four to eight drives.

A second benefit to this method is that the single logical drive becomes twice as large. Depending on how you have the array configured, the logical drive may well be larger than either of the physical drives. Most applications can't handle a file being split across two drives. If you have a 2GB database, you can store it on two 1.2GB drives configured as a single RAID array—without your application software becoming aware that it isn't snug on a single volume.

I found it very straightforward to set up a level-zero array with EZRAID. If you have external drives, a simple disk write can produce quite a light show as each of the drives gets hit. With a four-drive array, I was able to cut the read-time for large files by approximately 70 percent.

These benefits, however, come at a price. With a two-drive level zero array, your data vulnerability effectively doubles. If either of the two drives goes bad, you lose your information. Having three or four drive arrays only adds to the exposure.

#### When data reliability is paramount

RAID level one is designed to address the data-integrity problem. With RAID level one, a logical drive is completely mirrored on another drive. Every write instruction is actually implemented on both drives, so they are constantly synchronized.

The beauty of this storage technique is that it should prevent you from ever losing access to your

data. If one of the drives fails, EZRAID displays a message that lets you know which drive is having a problem. All of your processing continues, though, running exclusively from the mirror image. What's even better is that when you reattach the fixed drive, EZRAID automatically brings it back up to synchronization. In fact (if your hardware permits this—a good argument for external drives), you can "hot swap" the new disk in while the system continues to run; just use an EZRAID option to temporarily suspend disk I/O, perform the change, and restart. If you're totally paranoid, you can allocate a drive (or a partition of a drive equal in size to the disk being mirrored) that is connected to your system but stays in standby mode until a disk fails. When a failure occurs, the standby disk is automatically hot-swapped into the array.

Some extra overhead exists when managing mirroring, and there is a slight performance hit as a result of writing all data twice. Some people claim that reading from mirrored drives is faster, presumably because of overlapped reading of parts of the file from each drive. In practice, I can't say that I saw much improvement. Performance, however, isn't the point of RAID level one. People who are looking for a combination of data integrity and faster processing will need to explore higher RAID levels.

### Seeking the best of both worlds

RAID levels two through five are different techniques designed to combine the benefits of levels zero and one. Levels two, three, and four require a minimum of three separate physical drives—one of which is set aside for error correction code (ECC). The ECC is encoded information that can be used to rebuild the contents of the drives in case of an error. However, unlike mirroring, the ECC takes much less space than the drive being protected. In fact, in an eight-drive array, one drive can hold the ECC required to rebuild the other seven. Levels two through four use a separate physical drive to hold the ECC for the data disks.

The levels differ in the technique they use for data striping. RAID level four divides the data into relatively large blocks (the same as RAID level zero), which are the units of distribution across the data disks. Levels three and two divide the data into progressively smaller chunks. The smaller chunks can provide greater overlap, and thus better performance, but they create much more overhead in managing the process. They can make sense for hardware solutions, but EZRAID doesn't offer levels two and three as the overhead of the software management would surpass any benefit.

The problem with all three levels is their dependency on the single ECC drive. Every disk write requires a write to the ECC drive as well as the data drive, which can eat into the striping gains. And what if the ECC drive is the one that fails?

### Having it All

For those reasons, I recommend RAID level five for systems with three or more physical drives. Level five performs striping at the block level, but the ECC information is also scattered across the available drives. This feature removes the performance bottleneck created when all writes go through a single drive and lowers the integrity exposure that dependence on a single drive brings. Using four physical 234MB drives, I set up a RAID level five partition that appeared to OS/2 as a single logical drive of 698MB (with the rest reserved for the ECC information). As a result of the extra ECC encoding, performance wasn't quite as snappy as a level-zero array, but the difference was slight, and well worth it for the additional data integrity.

To test that integrity, I simply pulled the cable from a disk drive while the system was running (don't try this at home). As expected, EZRAID informed me of the disk error, and kept on running. Network administrators take note: it makes sense to consider buying four 540MB drives instead of two 1.2GB drives to get the performance advantage of broader striping.

### Glee or Flee

RAID disk-array manufacturers are moving into OS/2 as slowly as application developers, and OS/2 hardware RAID solutions are as rare as Microsoft OS/2 applications. EZRAID replaces OS/2's disk device driver, letting you take advantage of RAID technology with the disk drives you already have. Because it is a software solution, it is slower than the hardware offerings, but can still improve performance and data integrity.

Anyone with more than one disk drive can benefit, to some extent, and those on a network should consider the benefits of RAID sufficient motivation to use

## Why striping speeds disk I/O

Reading from and writing to disk drives takes place much more slowly than information transfer within main memory. Even multithreaded programs can force you to wait during disk operations.

Striping divides the data into pieces and sends a piece to each of the drives in the RAID array simultaneously. By letting more than one drive operate at a time, the delay while the program waits for the data to be read, or for acknowledgment that the data has been written, decreases.

# WordPerfect

**FOR WINDOWS 6.0A IS THE FIRST WINDOWS APPLICATION THAT HAS BEEN TIGHTLY INTEGRATED INTO THE OS/2 WORKPLACE SHELL.**

multiple drives instead of a single large one. EZRAID provides those benefits in a very easy-to-use package. You can even mix and match levels, with one partition of a drive being a normal partition, another partition on the same drive being part of a level-one array, and yet another partition on that drive being part of a level-five array. The list price of $795, however, will relegate this product to the corporate network administrator. But, by the time you read this, Pro Engineering should have announced EZRAID Lite for individual power users. At a list price of $195, this version only supports level-zero striping across two drives or level one mirroring, but that will suffice for many people's needs.

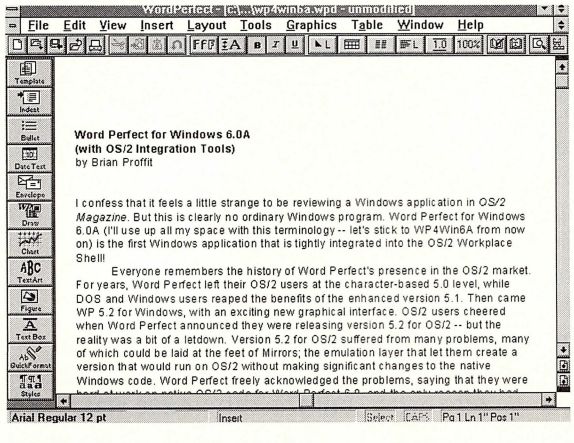
I found one thing annoying—call me nosy, but I was frustrated that I couldn't actually see how my information was being split among the drives. The high-end users, who make up a large part of the market for this product, will want to be able to examine the drive contents more closely, and Pro Engineering will need to include some high-quality disk utilities.

## WordPerfect for Windows 6.0A (with OS/2 Integration Tools)

I confess, it feels a little strange to be reviewing a Windows application in *OS/2 Magazine*; but clearly, this is no ordinary Windows program. WordPerfect for Windows 6.0A (WP4Win6A) is the first Windows application that has been tightly integrated into the OS/2 Workplace Shell.

Everyone remembers the history of WordPerfect's presence in the OS/2 market. Users cheered when WordPerfect announced their release of version 5.2 for OS/2, but the reality was somewhat disappointing. Version 5.2 for OS/2 suffered many problems, most of which could be attributed to Mirrors—the emulation layer that let them create a version that would run on OS/2 without making significant changes to the native Windows code. WordPerfect freely acknowledged the problems, saying they were hard at work on native OS/2 code for WordPerfect 6.0.

However, last November, WordPerfect made the fateful announcement that they were dropping all plans to release a native OS/2 version. Many of us considered the news to be a message that WordPerfect was abandoning the OS/2 market. I'm delighted to report the OS/2 Integration Tools in WP4Win6A prove us wrong.




I bring up all this history for a reason; WordPerfect's decision to focus entirely on the development of a Windows version is one other companies are wrestling with as well. As we know, there are many vendors who haven't shown any move into the OS/2 market at all. WordPerfect has proven that a Windows program can be made to behave largely as if it were an OS/2 application. Now, I'm not suggesting that all companies should create native products only on Windows, but if the five million OS/2 users can't convince you to design a native OS/2 product, follow WordPerfect's lead and at least do the additional work to integrate your Windows product into the Workplace Shell.

### But Brian, does it work?

One of the first things you notice when using a graphical word processor is how well the fonts are rendered on the display. At high resolutions, differences between products are slight. But, if you are running OS/2 at 640x480, WP4Win6A has the best display fonts I've seen in any word processor, whether OS/2 or Windows-based, whether TrueType, or ATM fonts. The font metrics are more consistent with TrueType fonts, giving a better representation at lower resolutions.

The trend toward the use of icon bars that provide quick access to common functions continues strongly in WP4Win6A with a Power Bar, a Button Bar, and even a Features Bar that pops up while you are using special features, like graphics. These bars are totally configurable, so you can keep the options you use most frequently only a click away.

The tutorial gives a good introduction to users who are new to graphical word processors. The Transition

Advisor helps people who are familiar with other word processors become comfortable with WP4Win6A techniques, and the Coach provides graphical walkthroughs to help you learn formatting techniques within your own document. Templates are also included to help Microsoft Word and Lotus Ami Pro users make the transition more easily.

### Added goodies

WordPerfect has virtually all the features you would expect from a graphical word processor, including context-sensitive pop-up menus. Many new features have been added as well. I particularly like the QuickCorrect feature. Most people regularly type certain words incorrectly. For example, I invariably let my index finger slide too far and type the word "move" as "moce." Also, because the rest of my fingers are slightly more fleet than my pinkies, when capitalizing a word I often don't get off the <Shift> key quickly enough and end up capitalizing the second letter in a word as well as the first. QuickCorrect monitors a list of common misspellings and corrects them as soon as you hit the space bar after the misspelled word. I added my favorite mistakes to the list, and WP4Win6A corrected them as I typed. This feature may put the copy editors at *OS/2 Magazine* out of work! (*Editor's note: not yet, Brian!*)

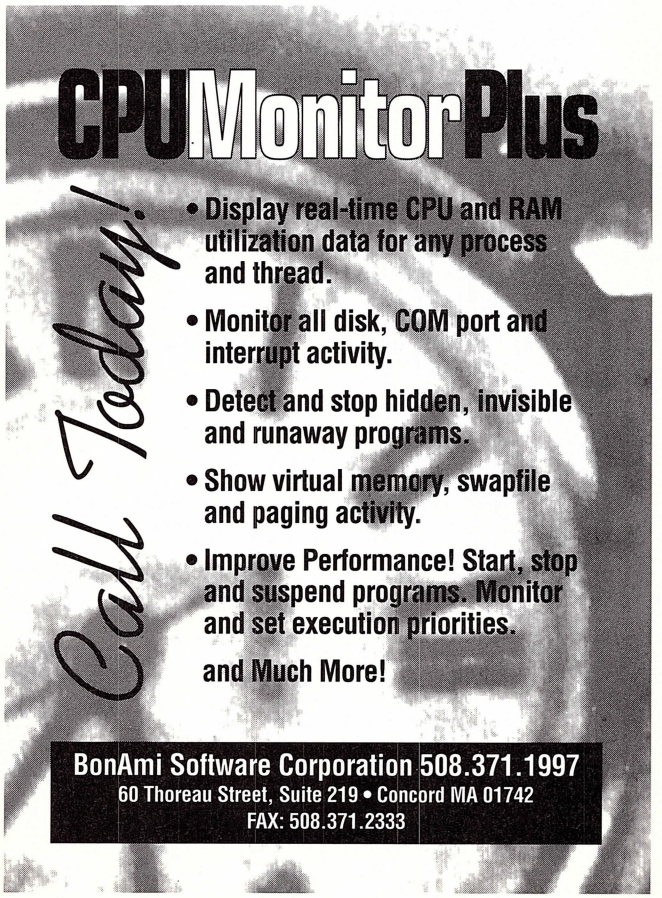
Other features include an excellent drawing program (that won't put Corel out of business, but is very rich for a bundled program), the requisite spell checker and thesaurus, and Grammatik for Windows.

### Does seamless equal speedless?

Philosophical arguments aside, one of the biggest drawbacks to Windows applications on OS/2 is the performance hit you take running them seamlessly on the OS/2 desktop. WP4Win6A is the first Windows word processor whose performance I found acceptable in seamless mode. In fact, WP4Win6A performs better on OS/2 than WP 5.2 for OS/2, which is an even greater accomplishment when you consider the extra overhead QuickCorrect requires monitoring every word you type for incorrect spelling.

### Integrated into the Desktop

The OS/2 Integration Tools set WP4Win6A apart from the pack. Windows users would be well advised to consider moving to OS/2 just to be able to get more power from this Windows application. These tools, however, aren't packaged with WP4Win6A, so you have to request the disk from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WordPerfect for four dollars, or download it from their BBS or CompuServe. It's certainly worth the effort, though, to get tools such as Automatic Document Detection (ADD). This utility scans folders when they are opened and registers documents found there as document objects. Those objects can then be opened directly, dragged onto WP4Win6A, or dragged directly to the printer. This feature isn't restricted to WP4Win6A documents—you can instruct ADD to register other document types as well, which will then be automatically converted when they are loaded into WP4Win6A.

WP4Win6A will accept drag-and-drop files from any file format it supports, including graphics, spreadsheet, database files, as well as other word processors. You can insert a document into one you're working on simply by dragging the new document into your window. You can also link an existing document (or graphic, spreadsheet, or database) instead of copying. That way, if the linked object is changed, the update is reflected in your new document.

**There has to be a "but"**

With version 6.0, WordPerfect introduced a new document-storage format. WP4Win6A imports WP 5.2 format documents seamlessly with an automatic conversion, but files stored in the new version 6.0 format cannot be read by WP 5.2 or the dozens of products that import files in WP 5.2 format. If you are planning to exchange documents with people not using WP4Win6A, you will need to save them in the 5.2 format. (Of course, DeScribe users are already accustomed to this problem.)

Every now and then, the minimized WP4Win6A's icon would disappear. It appeared in the Window List, but I couldn't restore or close it from there. Everything else kept running, but I couldn't use WP4Win6A again until I shut down and rebooted. I experienced this problem less frequently when I removed WP's QuickLaunch from the Startup folder. QuickLaunch is designed to load the Win-OS/2 overhead at boot time, thereby speeding the launching of other Windows programs. It isn't worth the additional hangs, though, and I recommend that you not load it.

One final problem I discovered was that the first time you run a macro, the Macro Facility is loaded into memory, and it stays there until you close WP4Win6A. (Even closing the separate Macro Facility window doesn't really remove it.) The problem is, it's a real CPU hog,

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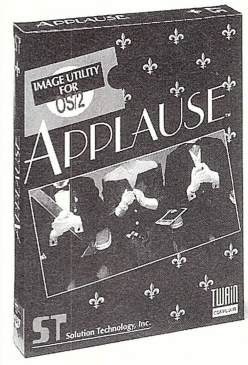


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slowing down the rest of the system. WordPerfect acknowledges these problems, so keep your eyes open for fixes in the near future.

### Glee or Flee

The casual user will probably be better off with a product like Footprint Works. The more serious user, though, will find that WP4Win6A has every feature they need in an easy-to-use package. The list price is $495, but you can upgrade from just about any competitor (or from WP 5.2 for OS/2) for $99. If you're thoroughly satisfied with DeScribe and adamant about not using Windows programs, I understand. If not, take a look at this program running on OS/2. For me, WP4Win6A is sufficient reason to install Win-OS/2. It is now my word processor of choice.

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**WordPerfect for Windows 6.0A ($495)**
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Fax: (801) 222-5077
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*Brian Proffit has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become the director of* PC Week's *Corporate Labs, and is now the president of Visionary Research. Brian is the author of two books on OS/2, is a contributing editor for* OS/2 Developer *and* OS/2 Magazine. *He can be reached on CompuServe at* 75300,1466, *or Internet* 75300.1466@compuserve.com.

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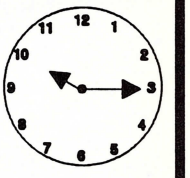

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# *Get Your Shortcuts Here!*

## Literally dozens of OS/2 tips that you can use today.

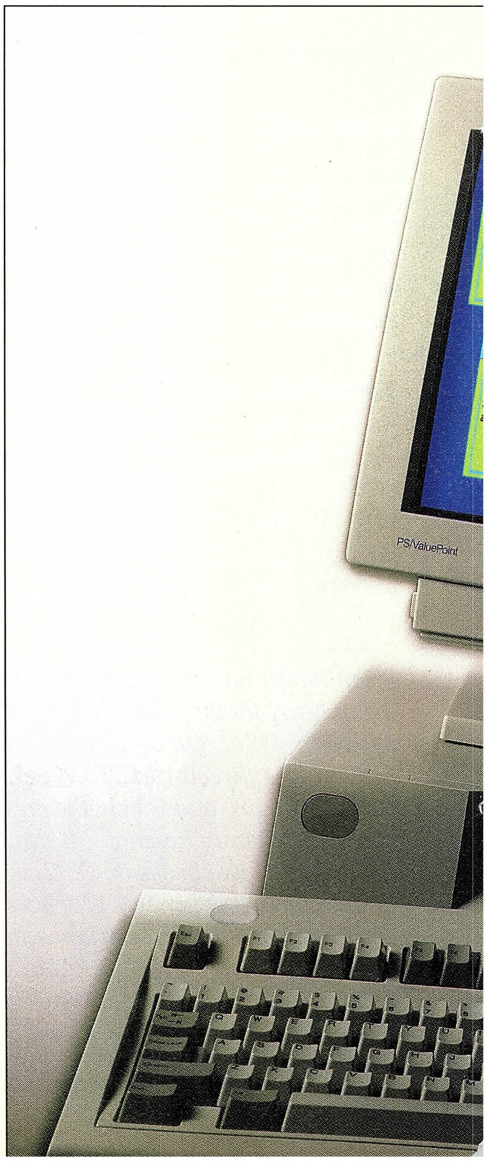
*Edited by*

*Alexander Antoniades*

The old adage "the right tool for the right job" is never more true than while using a personal computer. Sometimes, the tools are application software or utilities; often, they're the more literal Philips screwdriver. But perhaps the most widely used tools are those euphemistically named "Tips and Tricks," which can be found in nearly all computer magazines —*OS/2 Magazine* being no exception.

But everyone, from Sears Roebuck to Snap-On Tools, knows that you shouldn't just leave your tools lying around. Not only will they get rusty, but they'll probably get lost. That's why they sell toolboxes—and that's the philosophy behind *OS/2 Magazine*'s first collection of OS/2-specific tips, tricks, shortcuts, one-liners, secrets, and suggestions.

# 76 Tips



This first collection of tips, 75 strong, was supplied by David Moskowitz (DM), David Reich (DR), Lenny Bailes (LB), Rick Meigs (RM), Matt Hickman (MH), and Alexander Antoniades (AA), who we'd like to thank for their time and effort.

Our tips are specific for the various versions of OS/2 2.1: regular OS/2 2.1, OS/2 for Windows, and the various Service Pak upgrades. You'll find them conveniently organized under Workplace Shell, Configuration, and Devices. Next time, we'll have additional categories.

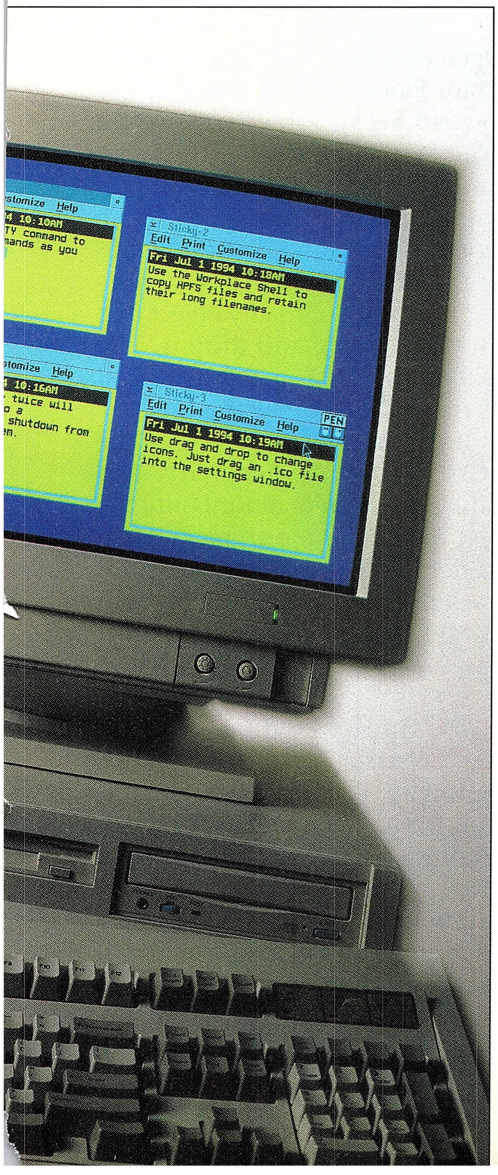
## WORKPLACE SHELL

### 1 Moving background windows without disturbing the foreground.

To move a background window without changing the active window, press and hold the <Ctrl> key while you move the window. *(DM)*

### 2 Making a second desktop.

You can float a copy of the desktop on top of applications by following this procedure. Open the Settings notebook for the desktop. Change the Open Object Behavior setting to Create New Window. If you now select Open Icon View and minimize the view, you'll have a second "floatable" view available. If you create a shadow of the desktop in the Startup folder, every time you boot OS/2, you'll open a second view of the desktop that can be floated to the surface any time you need it. *(DM)*




# for OS/2

### 3 Using the X-Window effect.

OS/2 routinely gives the current active window's application a priority boost. You can get the same effect by moving the mouse pointer over whatever window you want to get this automatic boost. So, if you have more than one window open and you want one to finish first, move the mouse pointer into it. *(DM)*

### 4 Working in a work area.

If you have a set of applications that you use together you can group them into a single work-area folder. When you open the folder, the applications and data files that were open the last time you used the folder will automatically restart. When you minimize the work-area folder, those active applications and data files minimize at the same time; similarly, if you close the folder, the current open applications and data files are marked and opened the next time you open the work area. You can also embed folders in the work-area; they follow the described behavior. *(DM)*

### 5 Moving an icon just a little bit.

If you want to move an icon on the OS/2 desktop only a few pixels, grab it at the edge, not at the middle. You can't drop the icon until the mouse pointer is outside the icon box, and if you start the drag near the edge of the box, the mouse pointer is outside the icon's area sooner. *(DM)*

### 6 Controlling the Startup Folder's order.

If you want to control the order of things in the startup folder, change its view from non-grid to flowed. Then, place the items in the folder in the order you need. *(DM)*

### 7 Navigating the Settings notebooks without a mouse.

Using Settings notebooks on a mouseless system? Try the following: <Alt+Up> moves the focus from the page to the tabs. <Alt+Down> moves the focus from the tabs to the page. <PgDn> moves you to the next page, and <PgUp> to the previous page. *(DM)*

### 8 Moving help files into a single folder.

To conserve screen real estate, move all of the help files into one folder—they'll be less visible and easier to find. If you'd rather delete these help files, several utilities allow you to delete undeletable objects. Check out the public-domain programs *blackh.zip* or *blckh3.zip*, both available in CompuServe's OS2USER forum and many bulletin boards. *(DR)*

### 9 Changing icon names.

If you change icon names using <Alt+Mouse Button 1> and want to end with the keyboard, try the <Enter> key on the numeric keypad or <Ctrl+Shift+Enter> if you have a laptop or a keyboard without the keypad. You can initiate the name change from the keyboard using <Shift+F9> and you can abort the change by pressing the <Esc> key. *(DM)*

### 10 Unarranging an arranged desktop.

There are a number of ways to recover from an accidental "arrange" command. If you accidentally Arrange the desktop, an immediate <Ctrl+Alt+Del> will restore the original desktop. Do *not* perform a "correct" shutdown using the desktop menu. That process saves the new (and unwanted) arrangement. *(DM)*

### 11 Unarranging a desktop, part II.

One way to prevent accidental arrangements is to add a custom menu item to the desktop. The menu items you add show up below Arrange. Thus, if you accidentally select the bottommost menu item, OS/2 will open the custom application, rather than destroying the desktop. To add a menu item, drag program-reference objects to the Actions on Menu list box at the bottom of the Menu page of the desktop's Settings notebook. *(DM)*

### 12 The turbo shutdown.

If you want a fast way to shutdown OS/2, press <Ctrl+Alt+Del> and wait for the beep that signals the start of the boot cycle. Then, turn off the computer. This procedure doesn't save icon positions, but it will properly close the file system. *(DM)*

### 13 Customizing icon title colors and fonts.

Open either the Font Palette or the Color Palette—both reside in the System Setup folder within the OS/2 System folder. Next, select a font or color that you like. If you will be changing the color of the icon text, press and hold the <Ctrl> key while using <Mouse Button 2> to drag the color to any object text on the desktop and drop it. The text on the desktop objects will all change to reflect that choice.

If you are changing the font, the <Ctrl> key is not necessary. You can drag any color or font onto the text to make these changes. Each folder can have its own distinct background, and the icon text attributes are stored on a per-folder basis. *(DR)*

### 14 Handy keyboard shortcuts.

Normally, you'll do most navigation through the OS/2 Workplace Shell with a mouse, but you may also want to be aware of the little-publicized keyboard shortcuts shown in Table 1, especially if you're using an OS/2 laptop on an airplane.

## Table 1: Keyboard shortcuts for weary travelers.

| Command | Result |
|---|---|
| <Ctrl+\> | Deselect every object on the desktop. (Follow this with <Shift+F10> to bring up the desktop menu for a session shutdown.) |
| <Shift+Esc> | Switch to and from the title-bar icon of an open window on the desktop. (Use this command when <Alt+Spacebar> doesn't work). |
| <Ctrl+Esc> | Bring up the Windows list. |
| <Alt+Esc> | Switch between open applications. |
| <Alt+Home> | Switch a DOS session between full-screen and windowed modes. |
| <Alt+Tab> | Cycle through open windows on the desktop. |

The following <Alt+key> combinations work in OS/2 applications, or in DOS and Windows sessions if you first press <Shift+Esc> to switch to the title bar.

| | |
|---|---|
| <Alt+F4> | Closes an OS/2 window that is open on the desktop |
| <Alt+F5> | Returns a maximized application to a smaller window on the desktop. |
| <Alt+F7> | Moves an application window around on the desktop with the cursor keys. |
| <Alt+F8> | Resizes an application window that is open on the desktop with the cursor keys. |
| <Alt+F9> | Minimizes a desktop window. |
| <Alt+F10> | Maximizes a desktop window. |
| <Alt+F11> | Hides a desktop window (LB). |

**15 The mouseless shutdown.** First, use <Ctrl+Esc> to bring up the Window List. Use the arrow keys to highlight the desktop window and press <Enter> to select the desktop window.

Next, press <Ctrl+\> to tell the desktop folder to deselect all objects on the desktop. Press <Shift+F10> to bring up the context menu for the desktop folder. Now, cursor down to the Shutdown item and press <Enter> to shut down OS/2. *(DR)*

**16 Getting rid of a stubborn Workplace Shell.** Have you ever encountered an OS/2 icon that simply refuses to disappear from the desktop no matter how many times you drag it to the shredder? One way to get rid of such icons is to insert a blank, formatted disk in drive *a:*. Then, click on the stubborn desktop object with <Mouse Button 2> held down, and select Move from the menu. Enter *a:* as the destination. After the object is moved to the disk, it will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disappear from the desktop. You can then reformat the disk to get rid of the object permanently. *(LB)*

## 17 Starting OS/2 applications as minimized icons.

While DOS and Windows applications allow you to set Start Minimized in their Settings notebook's Sessions page, native OS/2 applications have this option grayed out. Many OS/2 programs can be forced to start as minimized icons with the following trick.

Go to the Settings notebook's Program page, and deliberately misspell the application's name in the Path and Filename Dialog box. (For instance, add an *x* to the filename). Now, return to the Session page and you'll be able to select the Start Minimized option. Finally, return to the Program page, and respell the application's filename correctly.

This trick does not work with the OS/2 System Editor, the Enhanced Editor, and some system utilities, but it does work with most of the OS/2 Productivity Applets. *(LB)*

## 18 Launching a program with a hot key.

An old hook leftover from OS/2 2.0 allows you to start any single program with a hot-key sequence. Copy the program to the *\os2\bitmap* directory with the name *aaaaa.exe*. Then, use the **echo test > aaaaa.met** command to create a required file.

To activate the program, either give the desktop the focus or press <Ctrl+Esc>, and use the <Ctrl+Shift+Alt+O> (letter O not number 0) keystroke sequence. *(DM)*

## 19 Restarting a stopped system from the keyboard.

If you get the message that OS/2 has stopped (associated with either an internal processing error or a trap) you can restart OS/2 without toggling the power switch or pressing the reset switch by <Ctrl+Alt+NumLock+NumLock> (press the NumLock key twice), followed by <Ctrl+Alt+Del>. The NumLock sequence starts the OS/2 dump-disk tool. From this point, you press <Ctrl+Alt+Del> to restart the system. *(DM)*

## 20 Developing a Workplace Shell object.

If you're a software developer building Workplace Shell objects, try setting **runworkplace=cmd.exe** in *config.sys*. With this setting, you can start the Workplace Shell by typing **start /n pmshell.** Once the Workplace Shell is started in this way, you can test new objects. Register the object the way you normally would, then test the object's behavior. When you're finished testing, you can kill the Workplace Shell (use PSPM or some other tool). This procedure allows you to revise the object-class DLL as often as needed without rebooting OS/2. *(DM)*

### CONFIGURATION

## 21 Overriding application startup parameters

Depending on how you set up the program object and how you invoke it, the Workplace Shell passes the name of the desktop as a parameter when the object is opened. You can have the shell ignore this startup parameter by placing a percent sign (%) in the Parameters field of the object's settings. *(DR)*

## 22 Prompting for a response upon application startup.

If you place a question mark (?) in a program object's Settings Notebook parameters field, the Workplace Shell will display a window asking for the value of the parameter whenever the object is opened. When you enter the value (such as a file to be edited), that value will be passed to the program being started. *(DR)*

## 23 Environment cases in *config.sys*.

You can change the contents of the *config.sys* file to lower case to make it easier to read. If you do, be careful not to change the case of some environment variables if the application depends upon them (such as Borland's BRIEF editor or a C compiler). *(DM)*

## 24 Enabling file-deletion protection.

You can enable OS/2's undelete capability if you remove the **rem** ("remark," which OS/2 interprets as "ignore this line") from a line in *config.sys* :

```
REM SET
 DELDIR=C:\DELETE,512;D:\DELETE,512;
```

In this example, the **x:\delete** is the path and name of the directory used to hold deleted files and the 512 means up to 512KB of disk space can be used for undeleted files. You'll need to have both parameters for each partition that is used with OS/2.

OS/2 starts to reuse the undelete space if the amount saved in the directory exceeds the specified file size. The last file deleted is always saved even if it is larger than 512K. Some file-system operations may require more time to complete if this feature is enabled; if you're using Stacker for OS/2 and DOS, some file-system operations could take four times as long to finish. *(DM)*

## 25 Can't find *country.sys*?

If you get the message that OS/2 can't find *country.sys*, it actually may mean that it can't find *config.sys*. Before you check more esoteric causes for this message, make sure the root directory of the OS/2 boot volume contains a good copy of *config.sys*. *(DM)*

## 26 Moving basedev files to speed up boot time.

You can reduce the amount of time that OS/2 takes to boot if you move the device drivers specified in *config.sys*'s **basedev** statement to the root directory. *(DM)*

## 27 Using dircmd to automatically sort directories.

**Dircmd** is an undocumented parameter for OS/2's **dir** (disk directory) command that changes the the command's default behavior. For example, **set dircmd=/on** will force **dir** to always sorts directories in alphabetical order. You can use **dircmd** in any OS/2 session to change the behavior for that one session, or in *config.sys* to change **dir**'s behavior in every OS/2 command-line session. *(DM)*

## 28 Keeping programs from restarting.

If you want to change the way OS/2 automatically starts applications at boot time, add the line **set restartobjects = x** where **x** is:

- **Yes**: which is the default action if this line does not appear.
- **No**: to prevent programs from starting.
- **Startupfoldersonly**: to only start objects in startup folders at reboot/restart time (you can have more than one startup folder).

**Rebootonly** can be added to any of the preceding commands to prevent objects from starting if the Workplace Shell restarts itself after an internal error. For example, **set restartobjects = startupfoldersonly, rebootonly** will only start applications in the startup folders, but not if the Workplace Shell restarted itself because of an internal error. *(DM)*

## 29 Editing *config.sys* without damaging the file.

If you've just edited *config.sys*, and you see messages like "*oso001.msg* could not be found," upon rebooting, check the text editor. Some text editors wrap lines at a certain length, which may be the size of the window it is running in or some arbitrary or even user-set length. Most text editors will wrap lines at 256 characters.

The problem is that every statement in *config.sys* must be on one line. Statements such as **libpath** and **dpath**, for example, cannot wrap onto more than one line (as they often do in magazine articles). *Config.sys* has a line-length limit of 1,024 characters, but remember, you must have an editor that supports that length.

If you're using a word processor to edit *config.sys*, make sure that the

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file is saved in pure text mode, rather than in the word processor's own native format. *(DR)*

## 30 Installing and playing Mah Jongg.

Read the *readme* file that comes with OS/2. The Mah Jongg game is included with OS/2 2.1 but is not installed by OS/2's installation program. The instructions to install the game are in the *readme* document. *(DM)*

## 31 You should always install REXX.

Even if you're not a programmer or have no interest in writing OS/2 command scripts, always install the REXX interpreter included with OS/2. Many installation programs used by applications or utilities are actually REXX scripts that will not work if REXX is not installed. *(DM)*

## 32 Using the REXXTRY command-line help facility.

If you want some practice writing REXX code, try the REXXTRY command-line utility. If you type **rexxtry ?** you'll see some on-line help. If you want to execute a single line of REXX without creating a command file, you can type it on the REXXTRY line—for example, you can execute a quick calculation with **rexxtry say 'the answer is ' (121*345+19).**

If you want interactive REXX programming practice, type **rexxtry** without parameters. Type **exit** to end the REXXTRY session. *(DM)*

## 33 "Can't write to *.ini* files, changes are being saved."

This message can occur when the disk that the *.ini* files are stored in is full. Be sure to check the free disk space on the boot disk. *(AA)*

## 34 Stopping Windows icons from looking jaggy at higher resolutions.

At high resolutions, OS/2 displays icons in a 40x40 bitmap, but Windows icons are only 32x32 pixels across. By default, OS/2 attempts to magnify the icons, but the result is often unsatisfactory. Use the icon editor to paste the 32x32 Windows icon into a 40x40 space.

First, open up the icon editor with the migrated Windows application icon inside. Then, select all (<Ctrl+A>) from the Edit menu and <Ctrl+Insert> the icon to the clipboard. Next, go to the icon editor's Device menu and choose the List option <Ctrl+L>. Choose the Add option, and select 8514 - 16 colors. When you highlight this choice and select the OK button, this resolution will disappear from the list. Select Cancel to return to the Device List dialog box.

The Device List dialog box shows what information is contained inside the icon's *.ico* file. Select 8514 - 16 color or 40x40 icon, and the Windows icon should be unattractively magnified to 40x40. Clear this version of the icon by selecting the entire image (<Ctrl+A>), then deleting it (<Delete>). You should see a a blank 40x40 icon. Now, paste the original Windows icon into the frame <Shift+Insert>. Save it, and you're finished.

Now, the Workplace Shell will use the 40x40 icon frame with the 32x32 image pasted inside. The icon will appear smaller, but will not be distorted. *(AA)*

## 35 In 256-color mode, Win-OS/2 applications do not start seamlessly.

Check the DOS Settings notebook for the Win-OS/2 program reference objects that are having the problems. Ensure that the setting for **dos_umb** is Off for sessions that you want to start in seamless mode (a Win-OS/2 window), and set to On for full-screen Win-OS/2 sessions.

To change the setting for **dos_umb**, bring up the context menu for the program reference object you want using <Mouse Button 2>. Click on the arrow next to Open and then click on Settings. Now, go to the Session page and click on the Win-OS/2 Settings button. Use the mouse pointer or arrow keys to scroll down to the **dos_umb** setting. You will see the value on the right, which you can change. *(DR)*

## 36 Finding the best migration settings.

If you're not sure which settings to use for a newly installed DOS or Windows application, check the *database.txt* file located in the *\os2\install* directory. This is the text file version of the migration database. It may have suggested settings for the program—or at least something close. *(DM)*

## 37 Problems finding the best migration settings.

If you can't find settings in the *database.txt* file, try setting **win_runmode** to Enhanced Compatibility. This works for PageMaker 5.0. Also, make sure the **dpmi_memory_limit** setting is greater than 8MB. *(DM)*

## 38 Setting the window border width.

<Mouse Button 2> works in the Scheme Palette to help refine item selection. If you want to make window borders wider, open the Scheme Palette and edit the active (or default) scheme. The window-border width is set using a spin button on the right side of the window. To make changes apply to the desktop, hold <Alt> while dragging this scheme to the desktop. *(DM)*

## 39 Gaining control of a spawned DOS session.

Although OS/2 affords Windows programs the ability to start DOS programs, the specific DOS settings that the Windows session was started with are not passed on to such

child DOS programs. What if they need to be?

The Workplace Shell passes DOS settings to the session manager when initializing a Virtual DOS Machine (VDM), or DOS session. But when a Windows program calls the functions within Win-OS/2, a "plain vanilla" VDM is launched.

It is better to exploit Win-OS/2's ability to launch OS/2 sessions. OS/2 has an interface to allow REXX programs to start VDMs and pass the appropriate settings as defined in that DOS Program's Settings notebook.

If the Windows program you use lets you specify the name of the DOS program to be launched, specify the name of a REXX *.cmd* file instead of the desired DOS program and launch the DOS application in that *.cmd* file. If you can't specify the name of the program to be launched, rename the DOS program, and give its original name to the REXX command file. *(DR)*

## 40 Creating a new VDM that has the same customized settings as an existing object.

Use the Copy function in the object menu of a customized DOS object and rename it to the title of the new object. Then, open the settings and change the program name to that of the new program you want to run. *(AA)*

## 41 Using Advanced Power Management on laptops.

In addition to the Basic Input/Output System (BIOS) on a PC, a new standard has evolved for laptop systems, called the Advanced Power Management (APM) BIOS. As long as your laptop supports the APM standard, OS/2 will use it to help you get the most out of the laptop's battery. You will see a Power object in the System Setup folder if OS/2 recognizes the laptop's APM BIOS. *(DR)*

## Table 2: Troubleshooting PCMCIA problems.

| Order of Occurrence | Driver | Comment |
|---|---|---|
| 1) | *pcmcia.sys* | OS/2's Card Services provided by OS/2. |
| 2) | *com.sys* | Communications driver provided by OS/2. |
| 3) | *xxx.sys* | Card driver provided with PCMCIA card. |
| 4) | *yyy.sys* | Socket Service driver(s) provided with computer. |

## 42 Managing systems that sometimes use networks.

The trick is to create two *config.sys* files, one for use on the network, the other that ignores the network. First, copy the network-ready *config.sys* file to *config.lan*. This will be *config.sys* file when you want a network connection. Now, copy the same file to *config.nol*. This will be the *config.sys* file when you are not connected to the LAN.

Edit *config.nol*, and remove all of the LAN-related references including the **device=** lines for LAN device drivers, **path**, **libpath**, and other references to the LAN directories. Then, save the file.

Next, create two *.cmd* files, one called *lan.cmd* and the other called *away.cmd*. In *lan.cmd*, put the line **copy config.lan config.sys** and in *away.cmd*, put the line **copy config.nol config.sys**.

Now, before you shut down, if you intend to make the next bootup away from the LAN, type "AWAY" at an OS/2 command prompt and press <Enter>. Then, close the OS/2 window and shut down. The next time you boot, the system will not load the LAN drivers, and you will not see error messages.

If you need to make changes to *config.sys*, be sure to do so after running *lan.cmd* so that they'll apply to the more complete *config.lan* version, and create the slimmed-down *config.nol* version afterwards.

## 43 Troubleshooting PCMCIA problems

The most common problem in getting PCMCIA cards to work is incorrect ordering of the device-driver statements in *config.sys*. Each computer and set of drivers are different, so the best bet is to follow the instructions included with the PCMCIA hardware or the drivers themselves.

No hard and fast rule exists for ordering these statements (because the drivers vary between card and computer manufacturers) but in general, the rules shown in Table 2 apply. *(DR)*

### DEVICES

## 44 Setting up a maintenance partition.

If you are able to partition the primary hard disk, set aside 3MB for a maintenance partition. Instructions on how to create a single boot disk can be found in *OS/2 2.11 Unleashed, 2nd Edition* among other places. They will also work to create a maintenance partition, which can be used for booting the PC in case of an emergency. If you want a tool to automate the process, look for *boot2x.zip*, available on many bulletin boards, which can be used to create either a single boot disk or a maintenance partition. *(DM)*

## 45 Leaving room for growth.

When you decide on hard disk partition sizes, leave room for growth. Some Windows applications demand hard disk space in the *\windows* directory tree; be sure to leave enough space in that partition. *(DM)*

## 46 Changing the drive object's default view.

The Drives object is set up to default to the tree view. Change it by pressing <Mouse Button 2> to bring up the desired drives' context menu, then click on the arrow next to Open, and choose Settings to bring up the context menu. Click on the Menu page using <Mouse Button 1>. You will see two entries for the Available Menus. Click on the Open entry. Next, click on the Settings pushbutton next to it. This will bring up a window of menu settings.

The entry for Conditional Cascade is highlighted. Upon opening, there will be an arrow (such as the one you clicked on to get there) for a cascading menu, but it will also have a default action. A field for Default Action is under the Conditional Cascade. By clicking on the <Down> arrow next to the current default action, you can view the list of available default actions. Click on the one you want to be the new default, such as "details." Select OK and close the Settings notebook. The next time you open that drive object, it will open in the Details view. This action is inherited by all subfolders (subdirectories), unless you specifically change a subfolder's default view. *(DR)*

## 47 Using HPFS with hard disks larger than 128MB.

On disk partitions larger than 128MB, use HPFS instead of FAT—it wastes less space. *(DM)*

## 48 Enabling lazy write.

Don't disable lazy-write for either HPFS or FAT. If you're afraid of a power failure, treat the problem, not the symptom—buy an uninterruptable power supply. *(DM)*

## 49 Using a 32-bit disk controller if you have more than 16MB of RAM.

When OS/2 2.1 boots, it queries the hardware to determine how much total system memory is present. With 16MB or less memory installed, the memory is mapped to pages. If more than 16MB of RAM is installed and the disk controller can handle 32-bit addressing, all the memory above 16MB is also mapped to pages in the page tables.

If the disk controller does not support 32-bit operations, (24-bit controllers are common), then OS/2 will use that memory as a virtual swap file. In other words, if the disk controller cannot address the memory 32 bits at a time, OS/2 will use the memory above 16MB as a dedicated RAM disk, specifically for swap space. When data needs to be written to the swap file, the swapper will write the data to this memory first, and then to the physical hard disk if this space becomes full. This approach is not as efficient as direct memory access through page tables. *(DR)*

## 50 Speeding up access with IDE drives.

Some IDE disk and controller combinations may make use of a multisectored read buffer that speeds up disk read and write operations. To enable this feature on the controller card, add the following parameters to the **basedev=ibm1s506.add** line in *config.sys*:

```
BASEDEV=
   IBM1S506.ADD /A:0 /U:0 /SMS /V
```

If two disk drives are attached to the controller, add the additional parameters **/a:0 /u:1 /sms**. (The **a:0** designates the first controller card in the system, **u:0** and **u:1** represent the first and second attached hard disks, **/sms** turns on the multisectored read function and /v causes OS/2 to display a startup message that will tell you whether multisectored mode has been turned on successfully. *(LB)*

## 51 Using OS/2 compression programs to preserve EAs.

If you want to send files that have Extended Attributes (EAs) via electronic mail, do not use DOS compression tools like *pkzip*, since they'll strip away those EAs. Instead, use OS/2 compression programs, such as *lh2* and *infozip*, to compress (and later extract) the EAs. Both utilities are available on most OS/2 bulletin board systems. *(DM)*

## 52 Keeping long file names.

Use the Workplace Shell, rather than a command line, to copy HPFS files onto a FAT drive (such as a floppy) to store the long name in Extended Attributes (EAs). From the command line, the file name will appear as a normal FAT name (8.3), but when you access it via the Workplace Shell it will have the long file name. If you copy it to an HPFS volume, the long name will be restored. *(AA)*

## 53 Putting HPFS partitions at the end of the disk.

If you need a DOS partition, you'll also need at least one FAT partition for the DOS applications. Place HPFS and OS/2 applications at the end of the disk's free space. Putting them in this location is most likely to assure that drive mappings are consistent between OS/2 and DOS. *(DM)*

## 54 Corrupted EAs and the DIR command.

If you issue the DIR command and the command does not complete (or the results appear incomplete) you probably have corrupted Extended Attributes (EAs). Boot from the maintenance partition (or OS/2 boot floppies if you don't have a maintenance partition) and run *chkdsk /f* on the problem drive. *(DM)*

## 55 Using the scroll buffer to type commands.

The OS/2 command-line history buffer (the basic function controlled with the **set keys=on** or **off** statement) contains a hidden intelligence. If you start to type an OS/2 command and then press function key <F1>, OS/2 will complete the command based upon what you started to type. For example, C<F1> will cycle through any **copy**, **chkdsk**, **comp**, or other similar commands, while CH<F1> limits the search to **chkdsk**. *(DM)*

## 56 Making a window scroll faster.

To make a text window scroll faster, move the mouse pointer to the title bar, then press and hold either mouse button for a second or two. The scrolling text will appear to jump to the end. This procedure is possible because OS/2 continues to update the memory associated with the display window but doesn't physically update the display as long as it "thinks" that you intend to move the window. *(DM)*

## 57 Making a custom chain of commands.

OS/2 supports both conditional and unconditional command chaining. The & unconditionally starts the next command. The && sequence starts the next command only if the first one succeeds while || starts the next command if the first one fails. (for example, the command **prepare && saveit** will start the **saveit** program only if **prepare** works). *(DM)*

## 58 Speeding text-window scrolling.

To get the best scrolling performance from a text window, select a "by-eight" font. While the other sizes might look better on some monitors, video hardware is optimized for "*x*-by-eight fonts." *(DM)*

## 59 Making batch commands on the fly.

You can use some batch commands directly at the OS/2 command line. For example, if you want to remove extended attributes from DOS files, type **for %i in (*.*) do eautil %i** at an OS/2 command prompt.

It is also a good way to add wildcard capability to commands that don't support the feature (such as **eautil**). *(DM)*

## 60 Adding scroll bars to an OS/2 window

The default maximized width and height of an OS/2 window is 80x25. If you want to make the window larger, you can issue the **mode** command in the OS/2 window. For example, if you want to display an OS/2 window such that when it is


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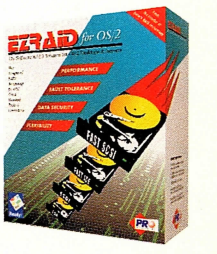

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maximized it occupies the entire screen and has a vertical scroll bar, you can issue the command **mode 80,102**, which will change the window to 102 columns and tell OS/2 to add a scroll bar and set the window such that, when it is maximized, it takes up the entire screen. *(DR)*

## 61 Enabling video-board acceleration.

If you have a high-resolution video adapter with hardware accelerators, check the documentation carefully. Use a video mode (and associated resolution) that actually uses the accelerator hardware. Some adapters only use the hardware assistance in their extended graphics modes. *(DM)*

## 62 Dongles and OS/2.

If you are having problems with a hardware anti-piracy lock (often called a "dongle"), you can open the settings for the printer attached to the parallel port containing the dongle and set the checkbox to Share:

Click <Mouse Button 2> on the printer object to bring up the context menu. Click on the arrow next to Open with <Mouse Button 1>, then click on Settings. When you see the Settings notebook, click on the Output tab. Look for the output port to which you have connected the dongle. Click on that port's icon with <Mouse Button 2>, then click on Open with <Mouse Button 1>. Click on the Shared Access checkbox to enable shared access. Now, close the Settings windows and the changes will take effect. *(DR)*

## 63 Avoiding printing troubles by using the right IRQ.

OS/2 reserves specific IRQs (hardware interrupts) for specific purposes, and using the wrong IRQ can cause problems when OS/2 tries to access the system in question. Here are the designated devices for specific IRQs *(DR)*:

| IRQ | Device |
|---|---|
| 0 | System Timer |
| 1 | Keyboard |
| 2 | Secondary Interrupt Controller |
| 3 | COM2 |
| 4 | COM1 |
| 5 | LPT2 |
| 6 | Disk Drive |
| 7 | LPT1 |
| 8 | Real-time Clock |
| 9 | Open |
| 10 | Open |
| 11 | Open |
| 12 | Aux Port (usually mouse) |
| 13 | Math Coprocessor |
| 14 | Hard Disk |
| 15 | Open |

## 64 Adding updated Windows printer drivers to OS/2.

When you install a printer object, OS/2 checks the *drvmap.inf* file in the *\windows\system* directory to see if there is an equivalent Win-OS/2 driver. You'll need to edit this ASCII file when installing a Windows printer driver that didn't ship with OS/2. *(DM)*

## 65 Checking those old printer cables.

If you see an incorrect OS/2 warning that suggests the printer is either off-line or out of paper , you might have a cabling problem. If you can't solve the problem through software, try:

- A shorter printer cable (the maximum length is six feet).
- Make sure every pin in the cable is connected (OS/2 uses interrupts to communicate with the printer, instead of DOS's slower technique of polling the printer, but interrupts require additional pins).
- Check the manuals to see if the installed parallel port supports interrupts (many don't). *(DM)*

## 66 Using NetWare Tools to log you into the network.

By using NetWare Tools to log into a Novell network, it is easier to assign drives and printer ports in a single OS/2 session as opposed to making changes in *config.sys* and rebooting. To use NetWare Tools in this way, first copy it into the Startup folder, then put the **.nws* file in the parameters area of the Settings notebook. Now, each time you boot up, you will log in via NetWare Tools. *(AA)*

## 67 Unattended NetWare login with password.

Logging into a NetWare server in an unattended mode is difficult, since none of the command-line utilities that can attach you to a server will accept redirected passwords.

The Attach command will take a password as a parameter within a login script. The login command will let you to override the use of a system login script and allow you to specify a custom script.

You will also need access to a NetWare server that has an ID and does not require a password. The standard "guest" ID works well here, since by default, it does not require a password. The login ID that you use needs no rights at all, as long as *login.exe* and the login script are on the local PC:

```
login fs1/guest /s
 c:/netware/login.scr pswd1
```

you can use a *login.scr* file that contains:

```
attach fs2/userid1;%2
attach fs3/userid2;pswd2
attach fs4/userid3;pswd3
attach fs5/userid4;pswd4
map m:=fs2/sys:directory
map n:=fs3/sys:directory/subdir
map o:=fs4/sys:directory
map p:=fs5/sys:
```

*(MH)*

## 68 Advanced COM port buffering.

If you want to find out if you have an advanced (buffered) communications port, type **mode comx** where **x** is the port number. If the **buffer=** (last line of the right-hand column of the report) shows anything other than **n/a**, you have an advanced port. *(DM)*

## 69 Improving CD-ROM performance.

If you have a CD-ROM, you can also set a read cache for it by setting the proper parameters on the **ifs=c:\os2\cdfs.ifs** line. The **/c:n** parameter sets the size of the cache, where **n** refers to the number of 64k segments for the cache (not the absolute byte count). For example, **/c:4** would set a 256K cache (4 x 64=256k). *(RM)*

## 70 Faster and less expensive installs with CD-ROM.

If you have a CD-ROM drive, buy the CD-ROM version of OS/2 and save about $10. If you want, you can create a set of OS/2 disks from the CD-ROM. It takes approximately one quarter to one half the time to install from CD-ROM as it does from floppy disk. *(DM)*

## 71 Installing OS/2 from a CD-ROM if its drivers are not included with OS/2.

If you have the DOS drivers for the CD-ROM drive, but they're not included with OS/2, here is what you need to do:

1) Make a backup copy of OS/2 Disk 1 using the **diskcopy** command from either DOS or a previous version of OS/2.
2) Copy the CD-ROM device driver *.add* file to this new disk. You may find that you do not have enough room on the disk for the file. If so, remove files to make room. One solution is to remove all files named **.01.sys* for MicroChannel computers, and **02.sys* for ISA-bus PCs.
3) Add a line to the *config.sys* file on this new OS/2 Disk 1 that points to the new *.add* file you've copied. For example, if the *.add* file is *newdev.add*, you need to add the line **basedev=newdev.add.**
4) Install OS/2 from the CD-ROM drive, but when prompted for Disk 1, insert the new, customized disk. *(DR)*

## 72 How *not* to write to a CD-ROM.

Many applications need to write to temporary files in their course of execution. Sometimes, it may try to write them to the current directory, which might be a read-only CD-ROM drive. In this situation, speci-


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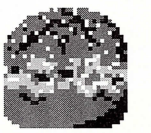

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fy temporary file directories in *config.sys*, and hope that applications will follow the rules. Add the following lines to *config.sys*:

```
SET TEMP = X:\temp
SET TMP = X:\tmp
```

where **x:** is the read/write hard disk on which you wish the temporary files to go. Be sure the *x:\temp* and *x:\tmp* subdirectories are created on these drives. *(DR)*

## 73 Using a 16-bit DMA channel.

If the installed sound board supports 16-bit direct-memory access (DMA), make sure you're taking advantage of it. Five, six, and seven are valid 16-bit channels (start with DMA 5). Some boards default to an 8-bit DMA channel (DMA Channel 3). Selecting the right channel may fix an "echo" problem. *(DM)*

## 74 Trouble with *.avi* files?

If you have an Indeo *.avi* file that doesn't play back using OS/2's MMPM/2, use a binary file editor and search for the string **rt21** and change it to **RT21**—some Windows programs don't follow the standard by writing it in upper case. *(DM)*

## 75 OS/2 for Windows mouse-installation problems.

OS/2 for Windows does not always install the appropriate mouse device driver when updating the system. To fix this problem, simply copy the mouse device driver from the OS/2 installation disks to the hard disk into the directory indicated by *config.sys*. For example, if *config.sys* reads **device=d:\os2\mouse.sys**, copy *mouse.sys* from the OS/2 installation disks to *d:\os2*. Then, shutdown and reboot. *(DR)*

## 76 Finding vmouse.

The error saying that **vmouse** is not installed means that for some reason, OS/2 cannot load the mouse device driver. If this system was previously working, you should check the connection from the mouse to the system unit: it may not be plugged in.

If it is a new installation, the mouse is plugged in, and you continue to get this message, double-check that you selected the appropriate mouse driver by opening the OS/2 System folder, then System Setup and then Selective Install. On the Selective Install panel, check the Mouse option, then select OK. The list of supported mouse devices will be displayed. Check the appropriate one and select OK, then follow the prompts. *(DR)*

---

*Do you have tips to share with your fellow OS/2 users that we haven't listed here? To contribute to our next collection, send them to* OS/2 Magazine *Tips, 600 Harrison St., San Francisco, CA 94107, or fax them to (415) 905-2499. Via e-mail, send them to Internet at os2mag@mfi.com, or to CompuServe at 71154,676.*


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# Audio Demystified

## What you need to know about OS/2's sound-board support. By Linden DeCarmo

OS/2 2.1 ships with multimedia extensions called Multimedia Presentation Manager/2 or, more commonly, MMPM/2. With MMPM/2, your PC can now make entertaining sounds and display smooth motion pictures. The big question is: Which sound boards work with OS/2, and what features do they offer? This article is not a hands-on review; rather, it's a discussion of the various boards and their major characteristics and OS/2 support.

### Advanced Gravis UltraSound

Advanced Gravis UltraSound was one of the first sound boards to have wavetable synthesis support. In fact, this board has become so popular among DOS users that many games, such as ID Software's Doom, have written specific support for Advanced Gravis boards. Besides its wavetable support, the UltraSound has other features that make it a good choice for OS/2. The board can play as many as 32 sound files simultane-

## Audio Glossary

The following terms are important in the digital audio world:

**Digital Audio:** A digital representation of analog sound waves. Each digital audio file can be decomposed into a series of samples.

**Sample:** Digital audio files are translated from analog sound waves that our ears process via a technique called sampling. The greater number of samples per second, the closer the digital file approximates the analog wave, and thus, the better the digital file sounds.

**16-Bit Audio:** 16-bit audio roughly equates with the sound quality of a conventional CD audio disc. Audio boards with 16-bit audio support can have much more realistic sound effects and better sounding speech. In addition, 16-bit audio boards offer superior speech-recognition capabilities because they have better audio-capture support.

**8-Bit Audio:** 8-bit audio has a much lower sound quality than a 16-bit sound file (such as comparing an analog cassette tape to a compact disc), because 8-bit audio has a much smaller range to store each sample.

**Wavetable Synthesis:** A technique used by the newest audio devices to play MIDI files. Wavetable works by mapping a note in a MIDI file to a sampling of an instrument in a digital audio file. Since the digital representation of the instruments are very true to the original instrument, wavetable synthesis sounds are much more realistic than the FM synthesis technique used by older sound boards.

**FM synthesis:** A technique that digitally creates (or synthesizes) the sound with a computer algorithm rather than using the actual instrument waveform. FM synthesis typically results in computer-like artificial sound.

**Mixer:** A software program that allows you to control the audio attributes (such as volume) for all devices connected to a sound board or DSP device.

**MPU 401:** A MIDI device that is the industry standard for external MIDI support, such as those found on external music synthesizers.

**Digital Signal Processors (DSPs):** Unlike conventional sound boards that are limited to playing audio files, DSPs are general-purpose chips that can run signal-processing software for audio, video, modem, fax, telephone answer machines, and numerous other functions. Since many DSPs offer software-upgrade options, these boards have a much longer life expectancy. Examples of popular DSPs are IBM's Mwave family, AT&T's 3210 running VCOS, and Creative Lab's AWE-32.

**Multi-instance:** Multi-instance means that many OS/2 applications can open and share the audio device all without intervention from the user. All OS/2 audio drivers are multi-instance except for the original Sound Blaster drivers that ship with OS/2 2.1. The latest Sound Blaster drivers from Creative Labs, OS/2 2.11, and the OS/2 2.1 Service Pack remove this limitation

ously and offers a mixer function. Two different models of the UltraSound series are available:

- **UltraSound:** This board includes all the previously described features, can play 16-bit audio files, and has 256K (expandable to 1MB) of memory for wavetable synthesis.
- **UltraSound Max:** The Max adds the ability to record 16-bit audio, record and play compressed audio files, and doubles the wavetable synthesis memory to 512K (expandable to 1MB). 512K of wavetable memory allows more instruments to be stored, resulting in more accurate wavetable synthesis.

Although drivers are not officially available from Gravis, two enterprising developers have written multi-instance drivers that have proved popular among Gravis users. These drivers are available on *ftp-os2.cdrom.com* as *ultra0xx.zip* and *gusos2xx.zip* (where *xx* is the latest version number) and on CompuServe's OS2USER forum as *gus01.zip* and *gus02.zip*. Advanced Gravis also has their own CompuServe section in the PCVENB forum.

### Aztech Sound's Galaxy Nova

The Aztech Sound Galaxy Nova 16 has become popular not only with end-users, but computer manufac-

**Table1: Sound Board Comparison.**

| Board | DSP Support | Runs SB Programs | OS/2-Based Mixer | Multi Instance Support | CD-ROM Interface | Driver Included with OS/2 |
|---|---|---|---|---|---|---|
| **Advanced Gravis** | | | | | | |
| Ultrasound | No | Yes(2) | No (4) | Yes | Yes(6) | No |
| Ultrasound Max | No | Yes(2) | No (4) | Yes | Yes(6) | No |
| **Aztech** | | | | | | |
| Galaxy Nova 16 | No | Yes | Yes | Yes | Yes(6)(7) | No |
| Business Audio(1) | No | No | No | Yes | Yes(5) | No |
| **Creative Labs** | | | | | | |
| Sound Blaster | No | Yes | Yes | Yes | No | Yes |
| Sound Blaster 16 | No | Yes | Yes | Yes | Yes(6) (7) | Yes |
| Sound Blaster 16 CSP | Yes | Yes | Yes | Yes | Yes(6)(7) | Yes |
| Sound Blaster 16 SCSI-II | Yes | Yes | Yes | Yes | Yes | Yes |
| Sound Blaster AWE-32 | Yes | Yes | Yes | Yes | Yes(6)(7) | No |
| **DSP Solutions** | | | | | | |
| Portable Sound Plus | No | No | No | Yes | No | No |
| **ESS** | | | | | | |
| AudioDrive | No | Yes | No | Yes | Yes(5) | No |
| **IBM** | | | | | | |
| AudioVation | Yes | No(3) | No | Yes | Panasonic | No |
| **Logitech** | | | | | | |
| Sound Man 16(10) | No | Yes | Yes | Yes | No | Yes(10) |
| **Media Vision** | | | | | | |
| Pro Audio Spectrum 16 | No | Yes | Yes | Yes | Yes(9) | Yes |
| Pro Audio Studio | No | Yes | Yes | Yes | No | Yes |
| Pro Audio Basic | No | Yes | Yes | Yes | No | Yes |
| Jazz 16 | No | Yes | Yes | Yes | Yes(8) | No |
| **Sigma Designs** | | | | | | |
| WinSound(10) | No | Yes | Yes | Yes | No | Yes(10) |

1) The Business Audio drivers support the Business Audio chips on Compaq, Toshiba and Microsoft Sound System boards.
2) With the SBOS emulator.
3) This support is not currently available with the OS/2 drivers.
4) Contact manufacturer for latest status.
5) The CD-ROM interface available will vary depending on the sound board. See manufacturer.
6) Mitsumi interface.
7) Panasonic interface.
8) Jazz16 has Future Domain SCSI and Panasonic 563 and Philips CM206 CD-ROM support.
9) Trantor SCSI, Sony 31A/33A and Philips LMS CM205 and CM206 options.
10) Use the PAS16 drivers that ship with OS/2 2.1or OS/2 for Windows.

turers as well. The Galaxy Nova 16 is a 16-bit sound board that contains a full-function hardware mixer. The board also offers Mitsumi or Panasonic CD-ROM support, MPU 401 compatibility, and the ability to add a SCSI interface or wavetable support as upgrades. The Galaxy Nova 16 OS/2 drivers and utilities are available on the Aztech BBS.

**Creative Labs' Sound Blaster**

Creative Labs' Sound Blaster is the *de facto* standard for sound in DOS-based game and multimedia programs. Since every modern Creative Labs board supports this standard, you can be assured that Sound Blaster-compatible programs should run under OS/2 with this board. In addition to basic compatibility, Creative Labs has an extensive family of sound boards that offer additional features:

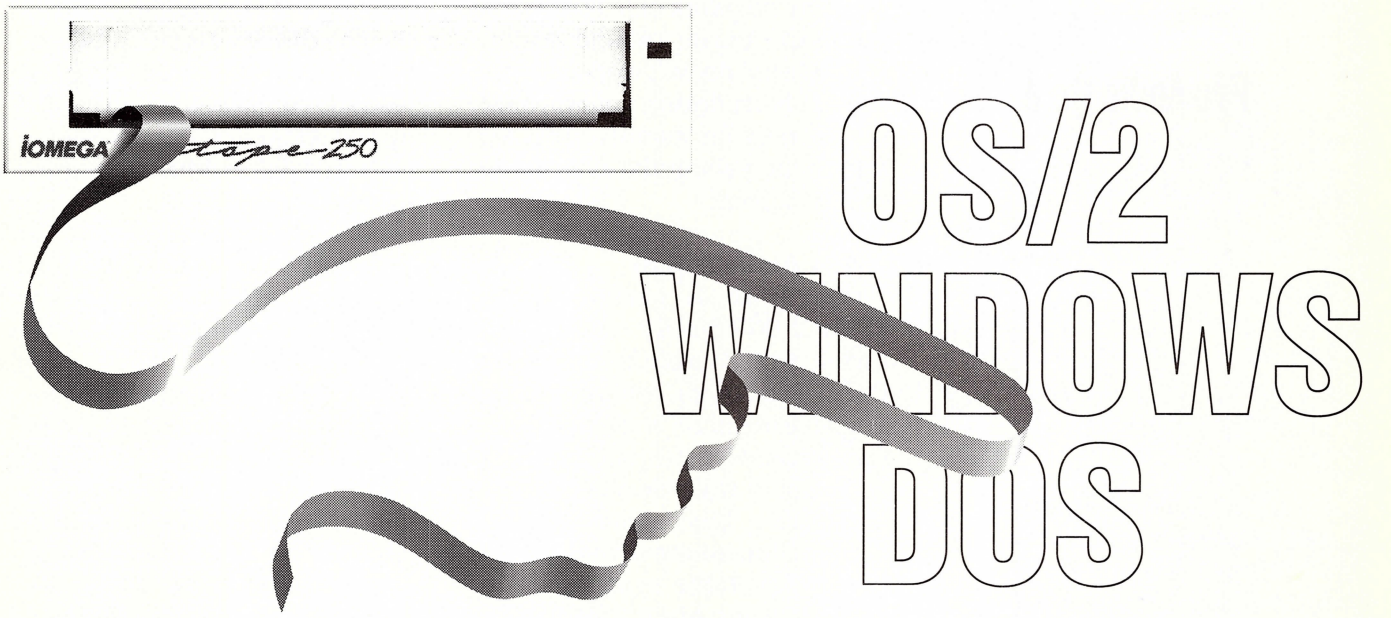
## Sound Blaster Tips

The ideal location for a Sound Blaster board is IRQ 5 DMA Channel 1 (or DMA Channel 5 if it is a 16-bit board), and I/O Address 240.

The initial Sound Blaster 16 devices required users to change jumpers on the board to modify the interrupt (IRQ) that the board was using. By contrast, newer Sound Blaster 16 boards no longer have jumpers, and their IRQ/DMA channels must be changed by an OS/2 device driver. If you have an Sound Blaster 16 without jumpers, you must obtain *sb_os2.exe* drivers from Creative Labs' BBS or CompuServe's BLASTER forum. If you are experiencing sounds being cut off when you play *.wav* files, you also need *sb_os2.exe*.

If you want to control the volume for the CD-ROM that is attached to your Sound Blaster board, you will need to obtain OS/2-based mixer software. Creative Labs has one available on their BBS and in their CompuServe forum.

- **Sound Blaster:** The distinguishing feature of this sound board is its low cost and compatibility with the Sound Blaster standard. It cannot play 16-bit sound files.
- **Sound Blaster 16:** The Sound Blaster 16 extends the Sound Blaster family to support 16-bit audio files and improved mixer functionality. Two different versions of this sound board are available; one supports Mitsumi CD-ROM drives, and the other supports Creative Labs Multi-CD CD-ROM drives.
- **Sound Blaster 16 SCSI II:** This board has all of the audio functionality of the Sound Blaster 16. It also has an Adaptec SCSI controller capable of not only handling double- and triple-speed CD-ROM drives, but other SCSI devices as well.
- **Sound Blaster 16 CSP (or SB16 CSP):** This audio board adds DSP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**If you have a pro audio-compatible board (such as the Logitech Sound Man 16 or the Sigma Designs WinSound 16) you shouldn't install the OS/2 Sound Blaster drivers. Instead, you need to install the Media Vision Pro Audio Spectrum 16 drivers.**

support to the Sound Blaster 16. The DSP is advantageous because it can be used to play and record compressed audio files. In addition, because the DSP is software-programmable, Creative Labs should be able to extend the functionality of this board with a software upgrade.

- **Sound Blaster 16 CSP SCSI II:** This board is the same as the SB16 CSP, but adds a SCSI II interface for supporting SCSI CD-ROM drives.
- **Sound Blaster AWE-32:** This board offers an advanced DSP (capable of addressing up to 28MB of information), which is used for audio compression, wavetable synthesis, and audio mixing effects. At the time of writing, beta drivers are available in CompuServe's BLASTER forum.

If you have a sound board that claims to be Sound Blaster-compatible, but your manufacturer does not provide OS/2 drivers, you can try to install the Sound Blaster drivers that come with OS/2. However, these drivers are certified only to run on Creative Lab's hardware and may not work on a board that claims to emulate a Sound Blaster. If your board doesn't work with the Sound Blaster drivers, you will have to contact your manufacturer for information about the availability of OS/2 drivers.

### IBM's AudioVation

AudioVation is part of IBM's MWave DSP family (which also includes the WindSurfer and Best Data's Ace board). AudioVation is available in MicroChannel and ISA versions and is essentially the only audio board available on the Micro Channel bus. Since the AudioVation uses an Mwave DSP, it offers wavetable synthesis and simultaneous MIDI and digital audio support. However, unlike its more powerful cousins, AudioVation was meant to be used as an audio device and does not have enough memory to be a general-purpose DSP device capable of fax, telephone answering machine (TAM), and modem functionality. If you desire a more general-purpose DSP-based board, WindSurfer is a better alternative. Drivers for AudioVation are available with the board or from IBM.

### Media Vision's Pro Audio

The Media Vision Pro Audio family of sound boards is really is two boards in one package. The Pro Audio series not only contains a 16-bit digital/analog converter for digital audio support, but has a separate Sound Blaster compatibility chip. This means that the Pro Audio driver can be used with OS/2 applications and, at the same time, have Windows audio programs use the Sound Blaster chip in WIN-OS/2. No other sound board is currently capable of simultaneous use. The following Pro Audio boards offer OS/2 support:

- **Pro Audio Spectrum 16 (PAS16):** This 16-bit sound board has a SCSI port for controlling CD-ROM drives.
- **Pro Audio Studio:** This board has all the features of the PAS16 and adds improved sound quality and additional Windows utilities. The PAS16 drivers that ship with all versions of OS/2 will work with this board.
- **Pro Audio Basic:** The Basic is a lower-cost version of the PAS16 that does not include a SCSI port.
- **Jazz16:** This board ships primarily with OEM systems and differs from the Pro Audio family in that it does not have separate digital audio and Sound Blaster chips. Rather, it offers 16-bit audio support and the ability to run Sound Blaster programs on a single chip. OS/2 drivers are typically provided with the computer system.

Drivers for the Pro-3D board are be available from the Media Vision BBS or on CompuServe's MEDIAV-

## Pro Audio Q&A

**The PAS16 drivers don't load on my board:** It is likely that you have a mixer chip that is incompatible with the OS/2 driver. The boards with the unsupported chip have, written on the board, a model number that contains "0082," such as 650-0082-03. If you look at the chips on the board, the suspect chip has the part ID MVA-508B. Media Vision has updated drivers on CompuServe in the MediaVision forum that work with this new mixer chip.

**The SCSI port on my PAS16 offers very poor performance:** This is actually a problem with the Trantor SCSI driver and not a problem with the hardware or OS/2. You can either contact Trantor to request improved drivers or purchase a different SCSI interface.

**Which drivers should I install for Win-OS/2?** The preferred method for obtaining audio support for Win-OS/2 is to install the Thunderboard drivers that ship with Win-OS/2.

ISION forum. If you need SCSI drivers for your Media Vision sound board, download *mvos2.exe* from the appropriate on-line service.

If you have a Pro Audio-compatible board (such as the Logitech Sound Man 16 or the Sigma Designs WinSound 16) you shouldn't install the OS/2 Sound Blaster drivers. Instead, you need to install the Media Vision Pro Audio Spectrum 16 drivers.

### Sound Chipsets

Several PC and laptop manufacturers are building audio capabilities directly into their systems' motherboard. In most cases, they'll be using one of the following audio chipsets:

- **AudioDrive:** The AudioDrive chipset, from ESS, is used by several graphics accelerator and audio boards and will be a part of several upcoming audio boards. The AudioDrive is a 16-bit sound chip, can support CD-quality sound and has multi-instance audio support. Drivers are available in the OS2USER forum on CompuServe.
- **Business Audio:** The term "Business Audio" was popularized by Compaq when they included audio support as a standard function on some of their PCs. The Business Audio chipsets (primarily the Analog Devices 1848 or Crystal Semiconductor CS4231) offer the ability to play both 8-bit and 16-bit digital audio files and some forms of compressed audio. Business Audio drivers are available from IBM on CompuServe's OS2SUPPORT forum, from the Internet on *software.watson.ibm.com,* and the OS2BBS. These drivers have been certified to work with the Microsoft Sound System, Compaq PCs and the Toshiba Business Audio laptop. If you have a board or system that is not currently on the supported list for this driver, you may want to test the drivers—it is possible that they work but have not yet been fully tested.
- **Portable Sound Plus:** If you need a portable audio system for a laptop that doesn't have an expansion slot, one option is DSP Solutions' Portable Sound Plus. This device plugs into the parallel port on your laptop and gives you both MIDI and 16-bit Business Audio support. Drivers are available on the DSP Solutions BBS.

## Common Audio Problems

**Repeating sound effects:** If you experience repeating sounds or never-ending audio effects, it is likely that you have a hardware conflict with your audio device.

**Can't print after installing sound board:** Your sound board is on IRQ 7—move it to a different IRQ.

**Can't run multiple DOS multimedia programs:** Under the current version of OS/2, you can only run one DOS multimedia application at a time. If you need to run more than one DOS multimedia program at once, you can set the DOS setting **audio_adapter_sharing** to **none**. This will allow the application to run without audio support if another application is using the audio board.

**Can't hear the CD connected to the sound board:** You will either need to check the wire connecting the CD-ROM to the sound board or obtain a mixer written specifically for your sound board. This will enable you to control the audio levels for the CD-ROM drive.

---

*Linden DeCarmo is a multimedia developer for IBM's OS/2 and OS/2 for the PowerPC. He can be contacted at 74247,2100 on CompuServe or lad@vnet.ibm.com on the Internet.*

## RESOURCES

**Advanced Gravis Computer Technology Ltd.**
1790 Midway Ln.
Bellingham, WA 98226
(800) 663-8558, (604) 431-5020
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**Aztech Systems**
46707 Fremont Blvd.
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# REXX Goes GUI

## A look at GpfRexx, VisPro/REXX, and VX-REXX. By Brian Proffit

At the risk of sounding PC-centric, I think the Golden Age of REXX has finally begun. The REXX language has been popular on mainframe computers ever since IBM's Mike Cowlishaw invented it as a more-intelligent replacement for the batch language on 370-class machines. REXX is significantly easier to learn than lower-level languages such as C and C++. Just looking at **say 'Display these words'** in REXX rather than **printf('Display these words\n')** in C gives a quick but inadequate hint.

When OS/2 began including REXX as part of the operating system, developers saw it as the endorsement they needed to put some energy into bringing the language into the 90s. One advantage REXX has over products like Visual Basic or CA-Realizer is that applications written with those products must include the complete Basic runtime in their packaging. REXX programmers can count on the fact that the underlying REXX routines are already available to all OS/2 users.

### Something for everyone

Three new visual tools make REXX the most flexible language available for OS/2. Beginners will find a language that is easy to learn. Freeing beginning programmers of concerns about the vagaries of data types and the technical labyrinth of pointers and indirect addressing, REXX allows people to focus on getting from Point A to Point B without having to understand the details of the electronic ignition, fuel injection, and rack-and-pinion steering.

Experienced programmers find a language that lets them quickly and easily accomplish things that don't need the more elaborate technical structure of lower-level languages. It's true that REXX programs run somewhat more slowly than programs in compiled languages, but the speed is more than sufficient for many programs—particularly when you need to write one quickly.

Everyone will find developing graphical programs with one of these visual front-end products to be a relatively easy process. The classic example for programming tools is to write a program to display the text "Hello, world" on the screen. In a graphical environment, the challenge is to display that text in a standard window.

Using C code, a newcomer would need several hours of training on creating windows and writing a window procedure—a sophisticated program that handles the dozens of messages that OS/2 may send to your program when the user does things like hide or resize your window. That's *after* several hours of C instruction to cover the technical intricacies required to use the language and access OS/2's Application Programming Interface (API). With any of these REXX products, a newcomer should be able to display "Hello, world" in a moveable, resizeable window in their very first hour.

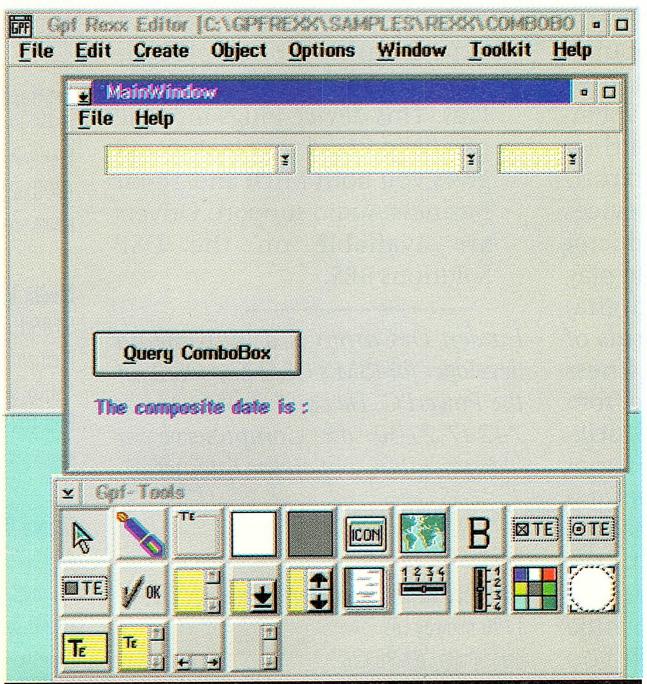


Figure 1: Gpf Systems' GpfREXX.

### One size doesn't fit all

The three products we will look at in this review, GpfRexx, VisPro/REXX, and VX-REXX, all include a complete set of features, with the ability to create the standard Workplace Shell objects. You can build your own notebooks and dialog boxes, complete with pushbuttons,

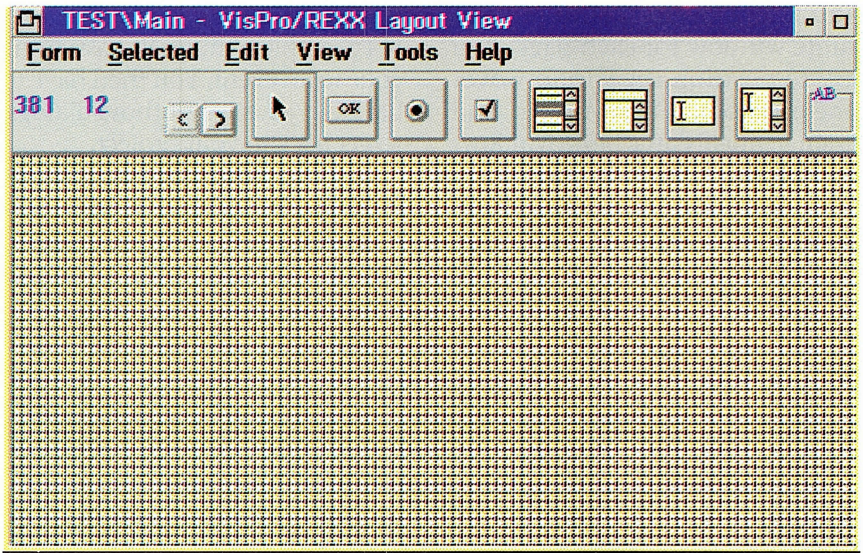


Figure 2: HockWare's VisPro/REXX.

check boxes, and all the other goodies. They are all also capable of building programs using Multimedia Presentation Manager/2 audio and video.

You can include routines from dynamic link libraries (DLLs) in programs created by any of these applications. It's done through the **RxFuncAdd** function included in the RexxUtil package shipped with OS/2. I strongly suggest you take the time to look through OS/2's on-line REXX documentation to get to know the functions included in RexxUtil.

Functions for accessing DB2/2 databases are available in all three products, and they all include the ability to assign "hint" text—a message that appears at the bottom of the screen giving instructions when the pointer is moved over an object. Each has an integrated debugger, with GpfRexx having an edge when you are debugging multithreaded applications.

They share weaknesses as well. All three need to think about the value of code reuse and make it easier to include existing routines in new programs. That doesn't mean cut-and-paste—that procedure just gives you several copies of the same routine to maintain. Rather, they should allow an **include** statement that will import the entire routine.

Clearly, these products have much in common, and they all do a reasonable job of providing a good environment in which you can create graphical REXX programs. We'll focus, then, on areas of specific note about the individual tools. As we examine the strengths and weaknesses of the three products, it becomes clear that there is no definitive best or worst among them. They each have areas where they excel. The secret lies in determining which product best fits your background and style.

## GPFREXX 1.0 LEVEL 4

Gpf for C has been available for

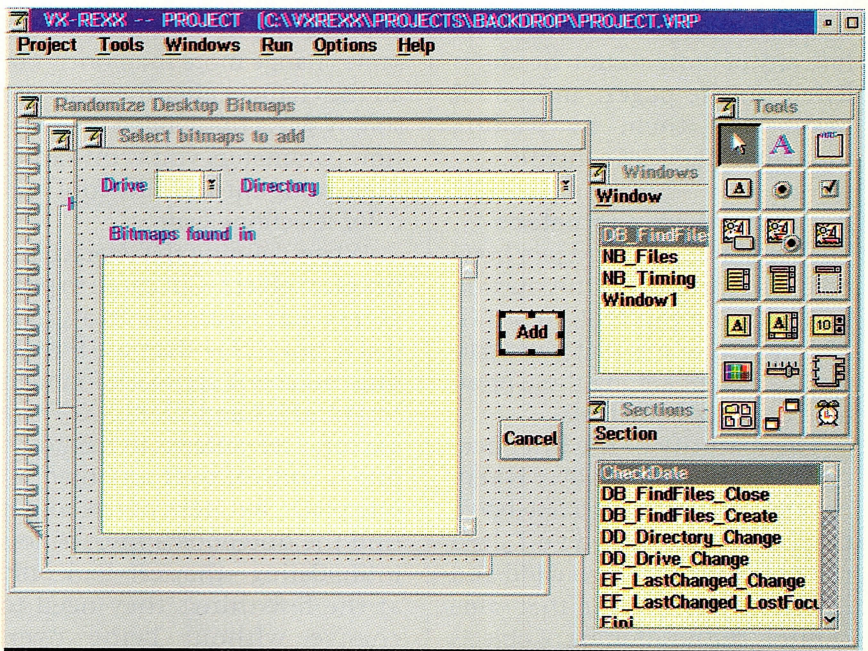


Figure 3: Watcom's VX-REXX.

three years, and GpfRexx both benefits and suffers from that heritage. The interface is mature, and the function list is rich—particularly in the more technical areas, such as sending user messages to windows. On the other hand, there is a "C feel" to GpfRexx that can be intimidating to those unfamiliar with C.

### Hope you don't need the book

The printed documentation is the most user-hostile of the three, with VisPro/REXX running a close second. It starts with a Table of Contents that is very hard to negotiate. For example, "Entry Help" appears literally dozens of times (and not indented underneath higher-level topics). The function reference part of the book is divided by function type, so don't expect to be able to look things up alphabetically. First, you have to decide if it is a multimedia, database, dialog, Presentation Manager, or System/Application function. Then, you have to find that section of the reference. You won't find any of those section headings listed on the pages, and you'll never find them by wading through the table of contents.

### A mature design interface

The tutorial does a good job, however, providing a nice introduction to navigating this tool. In fact, it highlights one area that is dramatically different among these products: creating a notebook.

The maturity of the interface-design portion of GpfRexx is very obvious when creating a notebook. Once you have placed and sized the notebook itself, you add and design its pages within that same control. The positioning of objects on the page is visually clear, and GpfRexx automatically restricts objects to the maximum available size on the page. In contrast, VX-REXX requires you to define a separate window for each page. You try to position the window over the notebook as best you can, and then manually attach the windows to the notebook. Some trial and error is needed to get the alignment exact. VisPro/REXX is even worse, with no way to place the secondary windows over the notebook to aid alignment. Placing your controls is hit and miss, and you have to close the secondary windows each time you want to test it, then reopen them to guess at the needed changes for the next attempt.

If you want to change the color or font of an object, you have to go to a separate dialog and define and save a "presentation parameter." You can then select that presentation parameter from a list and apply it to your object. If you're making a one-time change, it is just as annoying as it sounds. On the other hand, most of the time you're going to want to make the same change more than once. For all the changes after the first, you simply select the defined presentation parameters you want rather than going through the font and color selections again.

When defining the characteristics of an object, Gpf chose to pack as much as possible into a single dialog box rather than use the settings notebook approach found in VisPro/REXX and VX-REXX. There are some advantages to having so much control over an object in one place, but newcomers might find the notebook approach less intimidating—they can look only at the few things they need to change without being overwhelmed by the range of possibilities. You don't even get the full advantage of having everything on one page, since you often have to drill down several levels of dialogs to accomplish things like assigning code to an event. You then have to back out, closing all those dialogs, to get back to your project.

Another advantage of GpfRexx is its on-line help. It is truly context-sensitive, with meaningful instructions appearing whenever you press <F1>. Neither of its competitors offer the same level of sensitivity. Rather, they display general help from which you must trace through links to get to the desired information.

On the other hand, it is quite nice to be able to modify the text associated with an object by direct editing—clicking on the object while holding the <Alt> key as you do when changing icon text on the OS/2 desktop. GpfRexx is the only one of the three that forces you to open a separate dialog box to do this.

### Migrate your programs to C

Gpf Systems didn't just learn from their experience with Gpf for C, they duplicated much of the program. In fact, the interface designs made with either of those programs can be read by the other. In other words, if you decide (perhaps to improve performance) that you want to convert your REXX program to C, the interface you designed and saved in GpfRexx can be read and used directly by Gpf for C.

This ability gives you a great head start, since all of your forms are already complete. But don't overestimate the significance of this feature. All of your REXX code must be rewritten, and not all of the functions in GpfRexx are available in Gpf for C and the ones that

aren't will have to be coded manually. If you really think that a C program is your end result, try to keep your REXX program limited to the scaffolding code required to prototype the application to minimize the amount of duplicate development needed.

### VISPRO/REXX 2.03

If you rely on first impressions, you might be put off by VisPro/REXX—particularly if you are in 640x480 video mode. As you can see in Figure 2, the default alignment grid at that resolution makes the layout screen essentially unusable. You may also be surprised to see so few objects available in the tool bar. HockWare made the icons for the tools so large that they can't all be seen, even if you maximize the window. Having to scroll through the icons makes the tool bar significantly less convenient.

Doing your development at higher resolutions helps with that problem but you run the risk of creating programs that are too large for your users' displays. Window size is a real problem for VisPro/REXX since the size of the window you use to layout your program has no relationship to the size of the window created when you run the program! (I suppose that's why it doesn't bother to save your preferred window size and position with your project.) It can come as quite a surprise to position things perfectly in the design window and find that they aren't in the same places in the resulting program.

### More interface anomalies

I found the behavior to be non-intuitive. For example, to change the settings, you open a settings notebook. So far, so good. But when you're finished, you don't close the notebook as you do in every other case in OS/2 (or any other application I've seen). Closing the notebook ends your entire VisPro/REXX session. Instead, you go to the menu bar (a notebook with a menu bar??) and switch from the notebook view to the layout view. Of course, this is only true if you got there by selecting View/Settings. You can get to the same notebook by selecting Form/Open/Settings, and here you close the notebook normally. The same object has to be handled differently depending on how you get to it.

If you change your options in that notebook, be careful of the push-button at the bottom of the page. It's labeled Save Defaults. Well, your first thought will be that yes, you do want to save the changes you just made for this form. Actually, clicking on that button makes those changes the default for *all* forms in *all* projects. A simple change to the text on this button to remove the action word Save, like Create System Default, would prevent some big surprises.

I don't agree that everything must be visual. The tool bar is provided for those who prefer to select objects iconically. The list of tools accessed from the menu bar should be in text rather than another set of icons. Sometimes, it is easier to look for the words "list box" than to try to distinguish between tiny pictures of list boxes, combo boxes, and drop-down boxes.

When you do find and place the tool on your form, don't expect to be able to resize it the same way you do outside VisPro/REXX. OS/2 allows you to resize objects using either mouse button. VisPro/REXX forces you to use Mouse Button 2.

Other non-WYSIWYG aspects also annoy me. For example, if you change the title bar text for your application, it doesn't show up in the layout. You don't see that text until you actually run your application. The background color of the layout window isn't necessarily the same as the resulting program window either, so what looks good during design might not work visually in the resulting program.

Speaking of colors, VisPro/REXX forces you to either drag a color from the color palette or enter the specific numeric red, green, and blue values you want. The other products allow use of the color palette, but they also allow use of something fairly intuitive—words like "blue."

### Other surprises

Performance during move-and-size operations was sluggish and jerky. Be patient with the mouse, or the object won't change as you expected. In fact, you can move objects completely out of the VisPro/REXX window!

By default, all objects are assigned a four-digit ID, which is used for all access to that object. As a result, reading your source gives you no idea what object is actually being operated upon. Even the VisPro/REXX documentation uses these meaningless numbers rather than informative symbolic names, making it appear more confusing than it needs to be.

I strongly recommend going into the settings of every object that will be referred to in your program and assigning it a meaningful name. VisPro/REXX will use that name rather than the numeric ID in all future drag-and-drop programming steps. Unfortunately, you are restricted to upper-case letters for these names, which

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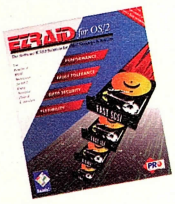

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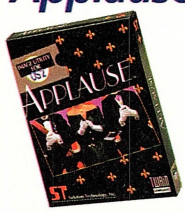


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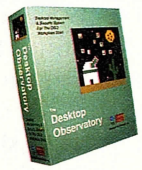


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## VisPro/REXX
**by Hockware**

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GTU20 ..... $115.00

FAXWORKS FOR OS/2 by SofNet
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hurts readability. Both GpfRexx and VX-REXX use only mixed-case symbolic names, guaranteeing that your programs will be more readable.

With VisPro/REXX, if you change the ID or name of an object, you receive a warning that you must also manually change it everywhere it is referenced in the project. Both of its competitors' products make those changes for you automatically.

When you create an executable from your layout, you aren't asked what name to give the program. Get used to the name *run.exe*. You'll be renaming things from that a lot. Okay, direct-editing the name from your project folder isn't really difficult, but I thought the reason OS/2 included standardized File Save dialogs was so the user could be comfortable, knowing that each program would work the same way.

However, the resulting executable is relatively small, and can include all of the library code needed at runtime. With VX-REXX, you need to include at least *vrobj.dll* with your runtime package, and that DLL weighs in at over 800K!

Contrary to the documentation (and unlike its competitors), VisPro/REXX forces you to manually save all secondary windows before attempting to run your application. Otherwise, any new or changed aspects will not be seen. That's why specifically following the steps in their documentation to create a notebook doesn't work.

### Rich functions

VisPro/REXX includes a rich set of functions for managing multiple threads, and includes the best support for semaphores to allow synchronization of tasks across the threads. I also appreciated being able to use direct editing of object text, rather than having to go into a properties notebook.

The Event Tree View is one the slickest ideas I've seen. Showing all objects with the events for which you've assigned programming really makes it easy to see what you've already done and quickly access the properties and code. I'd like to see HockWare expand on this feature in the future to include an option to show all possible events in the tree (similar to GpfRexx's event list), with the events that have code attached displayed in a different color. You should then be able to click directly on the event from the tree to add code to new events.

Even better was the ability to have the event and layout views of the form open at the same time. That really made it easy to select the best way to work with the form, no matter what you were trying to accomplish.

VisPro/REXX also excelled at programming drag-and-drop into your applications. While they all support this feature to some extent, the capabilities here are more complete and better defined. VisPro/REXX is offered in two versions: Bronze for beginners and Gold for more intense development.

## VX-REXX 2.0A

The VX-REXX environment gives you the most information about your project and the best accessibility to its different parts. Having windows containing all of your forms and functions right in front of you makes it much easier to get where you want to go. The cascaded pop-up menus on each object help you to go directly to the desired property or event you want to process for an object. This project interface is a dream.

Both GpfRexx and VisPro/REXX place new controls on your form with a default size that is often too small to be useful. You have to go through an additional step to size the object. VX-REXX allows you to draw the desired size of the object as you create it. This ability sounds trivial, but it sure makes VX-REXX feel smoother.

### A manual you don't dread opening

The documentation is extremely well organized and easy to use, partially due to the product's design. VX-REXX has a straightforward object orientation, with each object having certain properties, responding to specific events, and having predefined methods for changing its properties. Objects, properties, events, methods, and functions are all listed alphabetically in the same area of the Programmer's Reference, making it easier to navigate than books that divide them into separate sections. The explanations are clear, and meaningful examples are giving where appropriate.

### Advanced program development

You can interface VX-REXX programs with your commercial applications, too. It includes a tool for creating a Dynamic Data Exchange (DDE) client object built right into the tool bar. It lets you build applications that pull data directly from your spreadsheet or database, for example, and pull them into new custom formats in your program.

It also offers several functions included specifically to help in accessing information stored in standard OS/2 initialization (*.ini*)

files. While these are available to all REXX programs in the RexxUtil library included with OS/2, VX-REXX extends them and improves performance. In several other areas, particularly file-system manipulation, VX-REXX provides enhanced versions of functions contained in OS/2. In fact, you can use these improved functions even if you aren't doing a graphical program because VX-REXX supports development of windowless programs.

Other thoughtful additions include the ability to send a sequence of characters to a window as if the user had pressed the keys. This feature is especially handy when creating program-testing scenarios.

### The basics are covered too

VX-REXX is the only of the three products that doesn't assume you are already a REXX programmer. Dozens of pages of documentation are devoted to the underlying REXX language. If you're new to REXX development, you don't have to purchase additional documentation to use this product successfully. (Some vendors may tell you that their product's included functions are so rich that you don't need to understand REXX itself—don't believe them.)

### Add-ons

Regardless of which front-end tool you use, you might find programming even easier with some additional help. Personal REXX from Quercus Systems is a replacement for the REXX routines built into OS/2. It may seem odd to pay for something you already have, but there are a couple of good reasons for doing so. First Personal REXX is noticeably faster than OS/2 REXX, and makes REXX usable for a number of programs that might otherwise execute too slowly. The downside is that you need to buy a run-time license for each copy of the program you plan to distribute. On the other hand, Personal REXX also includes REXXLIB, a great collection of additional functions you can include in your program without paying a run-time royalty.

The vendors themselves are also producing add-on packages. For example, Watcom offers VX-REXX functions for the Watcom SQL database. HockWare offers a Data Entry Object Pack, containing a calendar, clock, formatted entry field, split bar, and spreadsheet object that you can incorporate into your VisPro/REXX programs. They also have a System Object Model (SOM) Toolkit, and have announced an Object Pack with objects and functions for Image Processing.

Check the famous electronic highway as well. In the OS/2 forums on CompuServe, you will find a number of REXX add-ons. Some (like VPXTRA for VisPro/REXX) are product-specific, but most of these utilities work with all three of these tools.

### And the winner is...

Each of these products has its advantages, so its difficult to call any one of them the single "best" tool. On the other hand, one of them may be the best choice for you. For example, if you're an experienced C programmer and/or someone interested in a REXX tool only as a prototyper, you might well prefer GpfRexx. Its C background and the ability to carry your interface layout over to the C version of their product suits that environment well. Those addicted to GUIs may prefer the complete point-and-click/drag-and-drop interface of VisPro/REXX. In between, an excellent balance between richness of function and ease of use, as well as between graphical operations and text/manual effort where it is more appropriate is present in VX-REXX. Newcomers won't find it intimidating, and experienced programmers won't find it patronizing.

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*Brian Proffit has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become the director of* PC Week*'s Corporate Labs, and is now the president of Visionary Research. Brian is the author of two books on OS/2, is a contributing editor for* OS/2 Developer *and* OS/2 Magazine. *He can be reached via CompuServe at 75300,1466, or Internet 75300.1466@compuserve.com.*

## RESOURCES

**VisPro/REXX ($99 [Bronze ed.], $299 [Gold ed.])**
HockWare
P.O. Box 336
Cary, NC 27512-0336
(919) 380-0616
(919) 380-0757 fax
CompuServe: OS2AVEND, section 8
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**GpfREXX (247.50)**
Gpf Systems Inc.
30 Falls Rd.
Moodus, CT 06409-0414
(203) 873-3300
(203) 873-3302 fax
CompuServe: OS2AVEND, section 11
READER SERVICE NO. 163

**VX/REXX ($199)**
Watcom International Corp.
415 Phillip St.
Waterloo, Ont N2L 3X2
(800) 265-4555 voice (North America)
(519) 886-3700 voice
(519) 747-4971 fax
CompuServe: POWERSOFT, section 16
READER SERVICE NO. 164

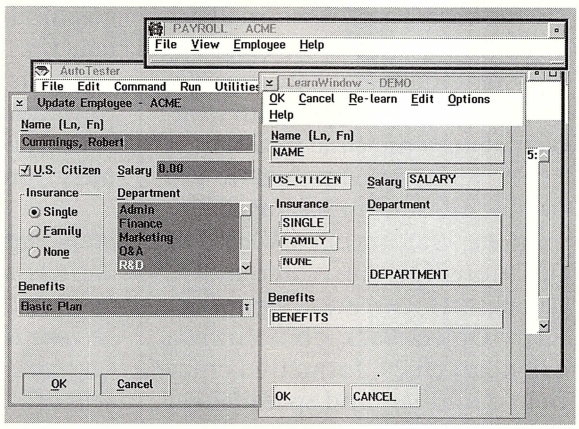
# Just Announced

**Late-Breaking Developments in the World of OS/2**

**AutoTester 2.0**

## Put your products to the test

AutoTester Inc. has announced the release of AutoTester 2.0 for OS/2. This program tests and verifies that GUI applications are working correctly. The testing includes synchronization, dynamic window placement and positioning, advanced control, querying, and manipulation, and actual text retrieval. Other features of the Workplace Shell application include a toolbar and multiple word-processor emulation tests. The pricing for AutoTester 2.0 for OS/2 varies depending on individual needs. Call AutoTester at (800) 328-1196 or (214) 368-1196, or fax (214) 750-9668.




READER SERVICE NO. 165

**OS/2 Quick Reference Library**

## Up to date information in a jiffy

Van Nostrand Reinhold has announced the first release in their six volume OS/2 Quick Reference Library. *WIN Functions* (ISBN: 0-442-01897-5) covers all window-management functions used by Presentation Manager to support windows. This spiral-bound, 512-page book is designed to be used by programmers as a replacement for the original IBM manuals. All volumes in this series will be written by Nora Scholin, co-author of the *OS/2 2.1 Corporate Programmer's Handbook*. This volume, and all future volumes, will be broken up into six sections: Function Names and Purpose, Include Files, Function Prototype, Parameters and Descriptions, Return Codes, and Related Commands. Future editions will cover a variety of functions, including Message, Workplace Shell, GPI, and DOS functions. All books in the series will be priced at $19.95. Call Van Nostrand Reinhold at (800) 842-3636 or (606) 525-6600, or fax (212) 282-5700.

READER SERVICE NO. 166

**Fax/PM 3.0**

## The object is to fax

Microformatic has announced the client/server release of Fax/PM 3.0. This release has been rebuilt from the ground up using IBM's DSOM (Distributed System Object Model). This networking fax utility runs on Netware, LAN Server, and TCP/IP networks and will run without a LAN by using NetBios as a transport layer. Fax/PM provides native printer-driver support in OS/2 and Win-OS/2, support for all system fonts, private and group phone books, and e-mail capabilities. Fax/PM sells for $150 for the stand-alone product, for an additional $49 you can add the OCR option, and for $2,300 you can add an unlimited number of users on a per-server basis. Call (203) 644-1708 or fax (203) 648-9587.

READER SERVICE NO. 167

**IPFIDE 1.0**

## Help file creation made easy

The Software Company has released IPFIDE, a utility for writing, editing, compiling, and testing *.ipf* files. This 32-bit Workplace Shell program offers a framework for the creation of *.inf* and *.hlp* files by turning most options into dialog boxes. IPFIDE is available from TSC Computing for $49. Call (817) 263-5766.

READER SERVICE NO. 168

**Secure Workplace for OS/2 1.52**

## It's 10 pm, do you know where your files are?

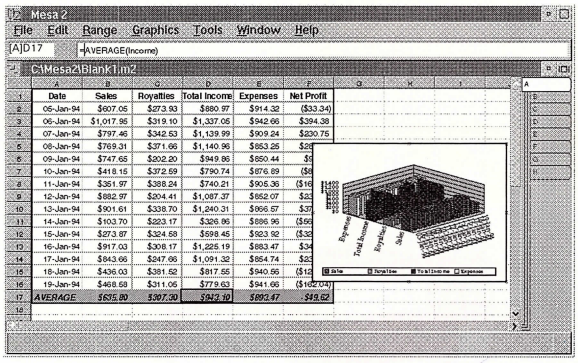
Syntegration has announced the latest release of Secure Workplace for OS/2. This product creates an additional settings notebook page on every object that will allow limited access to unauthorized users. Locked objects can not be moved, copied, deleted, shadowed, renamed, or reconfigured. Options include dynamic

Late-Breaking Developments in the World of OS/2

# Just Announced

### Mesa 2 for OS/2

## New OS/2 spreadsheet true to its object-oriented roots




Athena Designs has released the OS/2 version of their NextStep spreadsheet, Mesa 2. The OS/2 version is a multithreaded, 32-bit program that is compliant with IBM's SOM and OpenDoc standards. Mesa features the Mesa Object Library Interface, which allows other applications to directly access parts of Mesa without having to use the whole program. Mesa's three-dimensional workbooks can include up to 702 layers of 999,999 rows by 18,278 columns. Other features include two and three-dimensional graphs, a drag-and-drop interface, and SmartFill for cell replication. Mesa 2 is available in two editions, the Personal Edition, at an introductory price of $99, and the Enterprise Edition, which is priced at $499. The Enterprise Edition has an SQL interface, a larger object library, and more technical support. Call Athena Designs at (617) 734-6372 or fax (617) 734-1130.

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passwords for one-time access and a secure object template. Secure Workplace is available in an end-user edition that sells for $59.95, and an Enterprise Edition that includes a license for 10 users and sells for $549. Call Syntegration at (909) 464-9450 or fax (909) 629-3541.

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### EZRAID Lite for OS/2

## RAID on the Desktop

Pro Engineering Inc. has announced the latest version of a suite of software-based RAID products, EZRAID Lite for OS/2. EZRAID Lite can stripe or span data across any two disks, making them appear as a single logical drive to OS/2, and it mirrors the data on each drive. This utility supports IDE, SCSI, and ESDI interfaces and works with OS/2 2.1x or OS/2 for Windows. EZRAID Lite for OS/2 is available for $195. Contact Pro Engineering at (613) 738-3864 or fax (613) 738-3871.

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### Quantum Leap 2.1

## Let OS/2 SMP solve your business problems

Quantum Development Corp. has released one of the first SMP versions of an OS/2 application, version 2.1 of their business modeling tool, Quantum Leap. The program facilitates the creation and maintenance of complex business models through the use of a GUI interface. Quantum Leap accounts for asset management, budgeting, cash-flow planning, project management, portfolio management, resource allocation, and scheduling. They have added multi-processing to this release, and new solution techniques have been added to Quantum Leap's problem-solving engine. In addition, this utility now has an API that will allow programmers to embed Quantum Leap models and problem-solving code into their projects. Call Quantum Development (302) 798-0899 or fax (302) 798-6813.

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### Individual Training for OS/2

## OS/2 training via Windows

Individual Software has announced the latest addition to their Windows-based training programs, Training for OS/2. This interactive training course covers objects, desktops and windows, folders and organization, and printing and administration. Other topics include using the System Editor, object templates, application associations, and running DOS, Win-OS/2, and OS/2 sessions. Other features include a searchable category index and glossary and lesson check marks and reviews upon completion. Individual Training for OS/2 sells for $69.95 and $499.95 for network licenses. Contact Individual at (800) 822-3522 or (510) 734-6767, or fax (510) 734-8337.

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# Just Announced

**Late-Breaking Developments in the World of OS/2**

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## Your basic xBase for OS/2

On-line Data has released their xBase utility, OnCmd xBase for OS/2. This program converts FoxPro, Clipper, and dBase programs into 32-bit OS/2 Workplace Shell programs. Applications compiled using OnCmd can use WPS widgets, OS/2 fonts, and access C code or DLLs. Other features include multi-user support from single-user code, a multi-level menu system, and many xBase extensions. OnCmd is currently available at an introductory price of $149 for the single-user edition, and $249 for additional 10-user network expansions. After September, pricing will be $695 and $498 respectively. Call On-Line Data at (800) 265-2455 or (519) 579-3930.

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**Smart-Lock Lite**

## New OS/2 Lock, without a key

Corporate Information Management GmbH has announced a software-only version of their software-hardware OS/2 desktop security program, Smart-Lock. The new version, Smart-Lock Lite, has all the security features of Smart-Lock, but the user only has to type a user ID, whereas the full version of Smart-Lock requires an actual ID card to be put into an additional hardware device for user identification. Smart-Lock includes security features, such as restricting all object menus, assigning user-specific predefined unalterable desktops, automatic LAN log-on, and an automatic screen blackout that will return unattended workstations to the secure mode. Pricing for Smart-Lock Lite starts at $145 for the single-user version. Other pricing options include multi-user network packages and a C language API. Call Corporate Information Management GmbH at (81) 42 598 11 or fax (81) 42 548 43.

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# Creating Objects

## REXX AND THE OS/2 WORKPLACE SHELL

BY DICK GORAN

This month's column is my initial contribution to *OS/2 Magazine,* and I hope you will find it both informative and interesting. As the author and publisher of *REXX Reference Summary Handbook,* I have the privilege of being able to include segments of that book where it is appropriate.

An entire book could be written about the OS/2 Workplace Shell and managing its objects. However, I will try to capsulize both the creation and the manipulation of primarily two classes of Workplace Shell objects with OS/2 REXX—WPFolder and WPProgram objects.

If you have installed any applications on OS/2 2.x, there is a good chance that you have run a .CMD file that created a new folder, either on your Desktop or somewhere else in your system. The install program then included various objects into the newly created folder, which was done with the REXX functions described below.

Three WPS-related functions exist in the **REXXUTIL** API (an application program interface), which is installed on OS/2 when you select REXX from the *Setup and Installation* screen. When you install REXX, be sure to also select *REXX Information* from the More box on the *Documentation* selection screen. In the event that the REXX documentation is not available on your system, you can use *Selective Install* to add *rexx.inf* to your *Information* folder.

I will show you how to use three functions: **SysCreateObject()**, **SysSetObjectData()** and **SysDestroyObject()**. As the name of each of these functions implies, they are used to create a new WPS object, modify an existing object, or to remove an existing object from your system, respectively.

Workplace Shell objects generally are either real objects (a file or a directory) or abstract objects (desktop objects). These objects may be referenced with the three **REXXUTIL** functions with either their full file-system name (a fancy term that simply means the drive letter, path name, and file and extension of the real object) or an object ID.

An object ID is any unique string that is preceded by a less than character (<) and followed by a greater than character (>). Object IDs are case sensitive (**<Test>** is not the same as **<TEST>**). Object IDs are assigned to objects when they are created and remain with that object until it is removed. An object ID may be used as the location value when an object is created. For example, if you create a folder with an object ID of **<MYFOLDER>**, then that folder may be used as the location for program objects by specifying its object ID.

Generally, it is a good idea to construct an object ID from characters that occur on your keyboard (within the range of 032 to 126—'20'x to '7E'x). Object IDs can be assigned to real objects as well, and it is a good idea to assign an object ID to all WPS objects you create, unless the object is a template. Assigning an object ID to a template would create a conflict in the system because more than one object with the same object ID would then exist.

Each object belongs to a class. The majority of classes users will concern themselves with are those defined by OS/2 as standard classes. These classes can be listed using the **SysQueryClassList()** function in **REXXUTIL**. This function returns a compound, or stem, variable of all of the classes that have been registered in your system. In addition, the name of the DLL (dynamic link library) module that processes objects of each respective class is shown.

New classes can be registered (identified to the system) with the **SysRegisterObjectClass()** function.

For your convenience, I have included the definition of the **SysCreateObject()**, **SysSetObjectData()**, and **SysDestroyObject()** functions from the *REXX Reference Summary Handbook* in the sidebar on page 54.

The biggest mystery to creating WPS objects with the **SysCreateObject()** function lies in the "key name=value" pairs used in the setup string parameter.

Much of that mystery was eliminated by an excellent article published, with working examples, by Mike Lamb of IBM's ISSC - MHV Solution Center. This information

can be found on CompuServe in CIS:OS2USER, Lib. 5 as *crtobj.txt* and on most OS/2 BBS systems under the same file name or as *crtobj.zip*.

Though Lamb's information has not been updated since July 1993, it can serve as a starting point and is the best free source for the parameters used in creating WPS objects with **SysCreateObject()**. The most complete and accurate information for the setup string "key name=value" pairs available is contained in the *REXX Reference Summary Handbook*.

Another excellent source of information about objects that already exist on your system will be found in the **.rc* files in the \os2 subdirectory on your OS/2 boot drive. Do a dir *?:\os2*.rc* (where ? represents your OS/2 boot drive) to see a list of the *.rc* files. Specifically, Fragment 1 shows what you will see if you look at the *?:\os2\ini.rc* file (lines have been split for publication).

These "PM_InstallObject" lines are used by the system to create the standard system objects.

WPS objects fall into a hierarchy structure that results in objects subordinate to a class inheriting the appropriate characteristics of the classes higher up in its structure. Therefore, some of the parameters used with these functions are appropriate for all of the kinds of objects I refer to in this article (WPFolder and WPProgram). Others apply to either but not both.

I have included some working examples here that demonstrate some of the different uses of these functions. Listing 1 contains a REXX program that will create a new folder on your desktop. Before I explain the use of the **SysCreateObject()** function, I would like to make a couple of comments about the style of the code used in my examples because it may be a little different from what you are accustomed to seeing.

During my 33 years in the computer industry, I have developed a style for each language that I write code for. My style is predicated on two things: neatness makes for readability, and I am lazy when it comes to changing code. You will notice that, for the most part, I split parameters to a separate line and isolate them so that lines can be moved without affecting the line above or below the moved line.

Also, with REXX source statements, I generally use explicit concatenation (two vertical bars) instead of abuttal concatenation (placing eligible strings together without an intervening space) unless the latter is actually more

## SysCreateObject(), SysSetObjectData(), and SysDestroyObject() functions

```
SysCreateObject( class_name, title, location →
                                        →[, setup_string][, option] )
```

Returns 1 if a new object class was created; otherwise, returns 0.

*Class_name* is the name of the WPS class of which the object is a member and *title* is the new object's title. A new line character, '0A'x, may be included in *title*. The occurrence of the escape character ^ ('5E'x) also causes a new line to be created; however, 2nd and subsequent escape characters used for this purpose appear to be ignored.

*Location* can be either an object ID (any unique string preceded with a '<' and terminated with a '>') or a full file system path.

*Setup_string* optionally must contain a WinCreateObject string which is comprised of a series of "key name=value" pairs that change the behavior of the object. "Key names" are separated by semicolons and "values" are separated by commas.

*Note: If a value includes a semicolon (; - '3B'x) or a comma (, - '2C'x), it must be "escaped" by preceding it with a caret (^ - '5E'x).*

*Option* is a string which indicates the action to be taken if the object class already exists and may be: FAIL, REPLACE or UPDATE.

```
SysDestroyObject( object_name )
```

Returns the resultant code from WinDestroyData: 1 if *object_name* is destroyed; otherwise, returns 0. *Object_name* is either the object's ID (the unique string preceded with a '<' and terminated with a '>') assigned to the object when it was created or the full file system name of the object to be destroyed. Some of the predefined object IDs are shown in Table 1.

```
SysSetObjectData( object_name, setup_string )
```

Returns the resultant code from WinSetObjectData: 1 if *object_name* is successfully updated; otherwise, returns 0.

*Object_name* can be a WPS object ID (the unique string preceded with a '<' and terminated with a '>') assigned to the object when it was created (e.g. <WP_DESKTOP>) or a fully qualified file name.

*Setup_string* must contain a WinCreateObject string which is comprised of a series of "key name=value" pairs that change the behavior of the object. "Key names" are separated by semicolons and "values" are separated by commas.

**Fragment 1: PM_InstallObject lines**

```
STRINGTABLE REPLACEMODE
BEGIN
  "PM_InstallObject"  "Nowhere;WPFolder;?:\"
                      "OBJECTID=<WP_NOWHERE>"

  "PM_InstallObject"  "View;WPProgram;<WP_NOWHERE>;UPDATE"
                      "EXENAME=?:\OS2\VIEW.EXE;
                       ASSOCFILTER=*.INF;NOTVISIBLE=YES;
                       OBJECTID=<WP_VIEWINF>"

  "PM_InstallObject"  "Templates;WPTemplates;<WP_DESKTOP>"
                      "HELPPANEL=15680;NODELETE=YES;
                       ICONPOS=8 8;OBJECTID=<WP_TEMPS>"
        . . .
END
```

clear and meaningful in intent.

The folder created in Listing 1 will appear on your desktop. Its icon will be positioned in the horizontal center of the desktop and up 90 percent of the height of the desktop from the bottom. That position was set by the **ICONPOS=50,90;** parameter.

The folder's object ID is the same as its title, only the "<" and ">" characters surround it. Although the background has been set to the *blocks.bmp* image, because of a bug in OS/2, the background will not actually appear in the new folder unless its notebook is opened and the background tab is selected, which will cause the correct background image to be shown.

A couple of the most frequently asked questions by REXX programmers after they find the **BACKGROUND=** setting are: "can the *scaled* and *tiled* options be set with these functions?" and "how can I set *Always maintain sort order* for a folder?" Unfortunately, the answer to the first question is no. The *Always maintain...* option can only be set using SOM methods, and to set this option with a REXX program you need the assistance of a commercial program called DeskMan/2 from Development Technologies.

Finally, the folder has been opened on the desktop to its ICON view by using the call to the **SysSetObjectData()** function at the end of the program. The **OPEN=**

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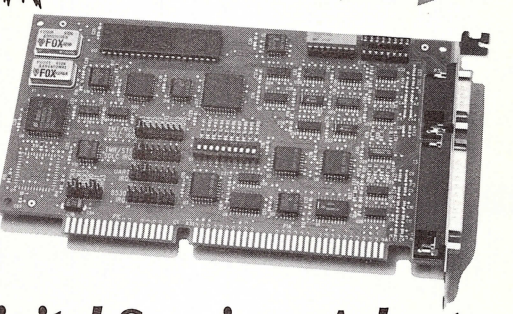

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ICON; parameter could have been included in the **SysCreateObject()** setup string just as well; however, its separate use shows how any object can be opened. Generally you specify **OPEN=DEFAULT;** unless you want to open a specific view. The options for the views are **DEFAULT**, **SETTINGS**, **ICON**, **TREE**, and **DETAILS**, when any of these options are valid for the referenced object.

I included the **NOMOVE=YES;** value to show one of the various style settings. The style settings include: **NOCOPY**, **NODELETE**, **NODRAG**, **NODROP**, **NOLINK**, **NOMOVE**, **NOPRINT**, **NORENAME**, **NOSHADOW**, and **NOTVISIBLE**. By the way, **NOMOVE** doesn't mean that you can not move the object; instead, it means that if you try to move the object from its present container—in this case the desktop—to another container (some other folder), it will result in the equivalent of a copy. The original will remain on the desktop but a copy will be placed in the container where it is dropped.

Most of the parameters that can be specified in the setup string used in **SysCreateObject()** can also be used in the setup string specified for **SysSetObjectData()**. One known exception is the **ICONPOS=x,y** setting, which is functional only when an object is created.

The **OPEN=DEFAULT** setting can be used to "open" any kind of object to its default setting (that is the setting with the check mark beside it when you select Open on an object's menu). You can even launch an OS/2 program.

Listing 2 shows the program **SYSLEVEL**, which merely displays the level of the OS/2 components, being started. After running the program in Listing 2, switch to your desktop and you will see an OS/2 session running **SYSLEVEL**.

Now, duplicate the line with the call to **SysSetObjectData()** and rerun this program with the two calls. I won't spoil the surprise that is in store for you.

An object's settings notebook will be opened by specifying **OPEN=SETTINGS**.In some cases, the changes that you make to an object's settings with **SysSetObjectData()** do not take

## Listing 1: Create WPFolder object on your desktop.

```
/* 9409-001.CMD - Create WPS WPFolder Object */
call RxFuncAdd 'SysLoadFuncs', 'REXXUTIL', 'SysLoadFuncs'
call SysLoadFuncs

wpf_title    = 'OS/2 Magazine^Test Folder'
wpf_class    = 'WPFolder'
wpf_location = '<WP_DESKTOP>'
wpf_setup    =,
   'OBJECTID=<' || wpf_title || '>;'||,
   'ICONPOS=50,90;'                 ||,
   'NOMOVE=YES;'                    ||,
   'BACKGROUND=BLOCKS.BMP;'         ||,
   ''
call SysCreateObject wpf_class,,
                     wpf_title,,
                     wpf_location,,
                     wpf_setup,,
                     'R'
if RESULT <> 1 then
   do
      say 'Unable to create ' ||,
          wpf_title
      exit 255
   end
call SysSetObjectData'<'wpf_title'>',,
                     'OPEN=ICON;'
exit 0
Create WPFolder object on desktop
```

## Listing 2: Launch WPProgram object with SysSetObjectData.

```
/* 9409-002.CMD - Launch SYSLEVEL in an OS/2 window */

call RxFuncAdd 'SysLoadFuncs', 'REXXUTIL', 'SysLoadFuncs'
call SysLoadFuncs

boot_drive = LEFT( VALUE( 'COMSPEC',, 'OS2ENVIRONMENT' ), 2 )
object = boot_drive ||,
       '\OS2\SYSLEVEL.EXE'

setup  = 'OPEN=DEFAULT;'

call SysSetObjectData object, setup
exit
Launch WPProgram object with SysSetObjectData
```

**Table 1: Examples of the predefined WPS object IDs (folders).**

| | |
|---|---|
| <WP_CONFIG> | System Setup folder |
| <WP_DESKTOP> | Desktop |
| <WP_DRIVES> | Drives folder |
| <WP_GAMES> | Games folder |
| <WP_INFO> | Information folder |
| <WP_NOWHERE> | Hidden Folder |
| <WP_OS2SYS> | OS/2 System folder |
| <WP_PROMPTS> | Command Prompts folder |
| <WP_START> | Startup folder |
| <WP_TEMPS> | Templates folder |
| <WP_TOOLS> | Productivity folder |

effect until the object's notebook settings are opened and closed (as in the background image example shown in Listing 2). This problem has been reported to IBM, but no solution has been offered by IBM as of this writing.

The **SysDestroyFunction()** is used to destroy an object (delete it). **SysDestroyObject()** will destroy objects that have **NODELETE=YES** in their style so caution is advised when using this function.

In conclusion, the REXX WPS alliance will provide you with the tools to manage most of your needs for creating and maintaining WPFolder and WPProgram objects. Admittedly, some object settings can not be handled in REXX. I am sure that IBM will address these shortcomings in a future release. The WPS class that is most sorely lacking in parameters for both creating and changing its objects is the WPPrinter class. Though a WPPrinter object can be created using **SysCreateObject()**, there is no way to alter the object's settings—a problem that needs to be addressed.

New information regarding WPS objects makes its way across the information super highway very quickly. New information is always being disseminated via the commercial forums (CompuServe, AOL, and so on), the Internet and your local OS/2 oriented BBSs.

---

*Dick Goran is the author of the* REXX Reference Summary Handbook, an OS/2 reference. *He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He is an OS/2 Advisor on CompuServe and is the owner of the OS/2 REXX forum on IBMLink. He can be reached at* 71154, 2002 *on CompuServe,* HONE81(DEV-4672) *on IBMLink and receives Fido Netmail at* 1:209/705.

**RESOURCES:**

***REXX Reference Summary Handbook, an OS/2 Reference* ($19.95)**
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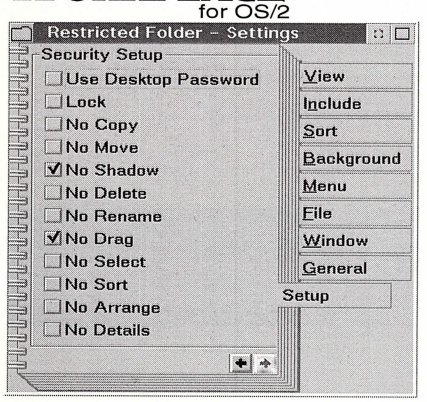


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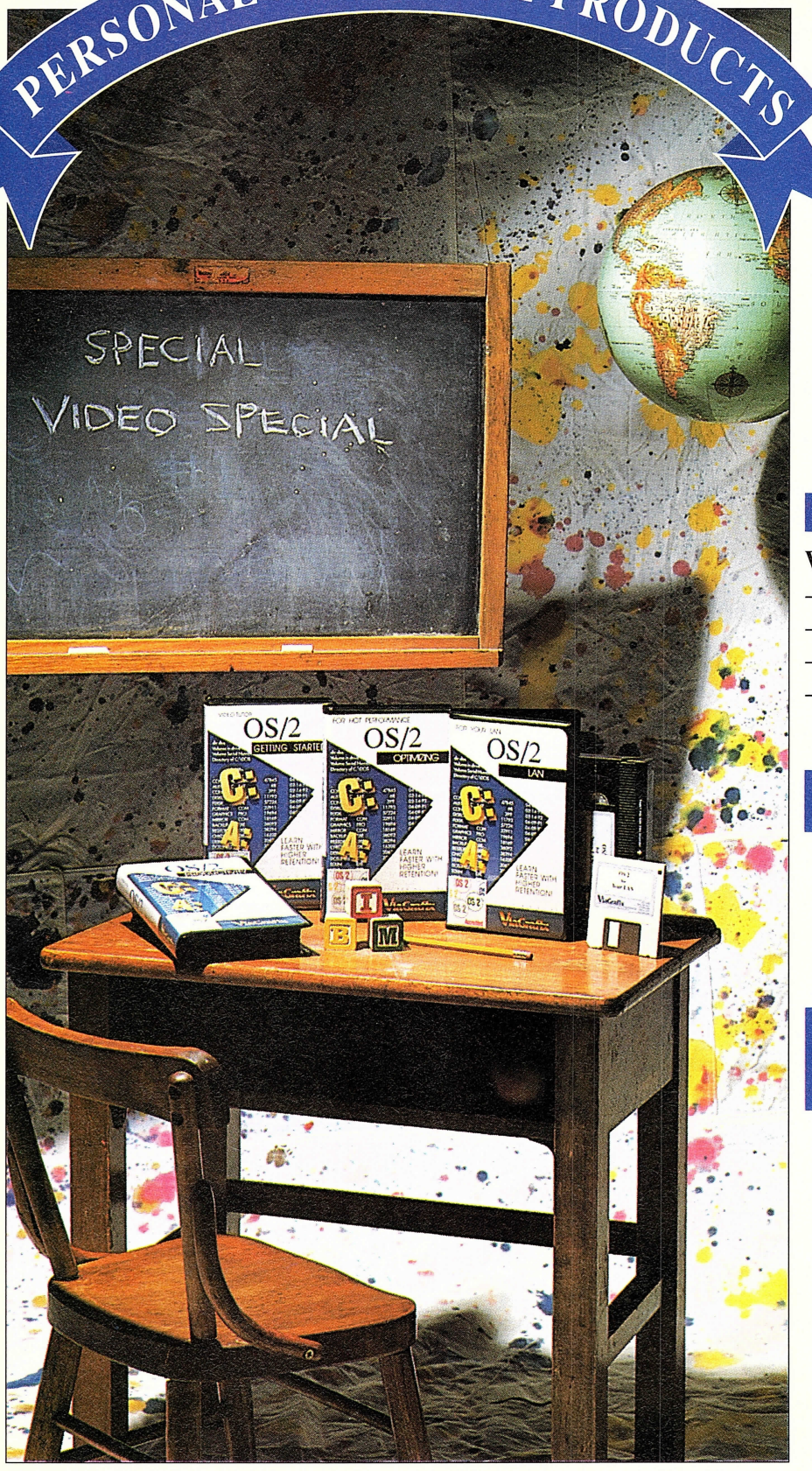


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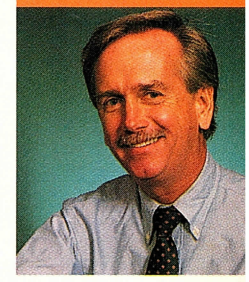

# Where are the drivers?

## WHO TO CALL FOR LATEST DEVICE DRIVERS.

BY DICK CONKLIN

Way back in the early DOS days, device drivers were unheard of. The operating system came with built-in support for the necessities of life: a display, matrix printer, floppy disk, and maybe a hard drive. Today's operating systems can barely keep up with all of the new computers, super high-resolution displays, laser printers, high-speed modems, CD-ROM drives and other hardware add-ons.

Device drivers are little programs that, ideally, are out-of-sight and out-of-mind. They serve as a buffer between the operating system and the hardware. When you install OS/2, you make some selections, and OS/2's installation program makes choices based on your hardware setup. A set of device-driver files are copied to your hard disk and called out in your *config.sys* file.

### Installation made simple

As you add new attachments to your computer, you'll probably add new device drivers. For example, if a low-cost, read-write CD-ROM drive captures the market, it shouldn't require a new release of OS/2. Chances are, the manufacturer will write device drivers for OS/2 and other platforms. Ideally, those drivers will come on a disk packaged with the drive. You'll just open your System Setup folder, select Device Driver Install,

## TABLE 1: Vendors of OS/2–Supported PC Attachments.

While the *pcmtab.zip* file is the most complete source of information on OS/2 device drivers, the following list provides voice and BBS access (where noted) for many hardware vendors, who can be contacted directly for current product and device-driver information. Companies are listed alphabetically by the type of products they offer (display adapters, disks, CD-ROMs, and so on).

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| | | (905) 882-2600 | |
| Avance Logic | | (510) 226-7220 | |
| Cirrus Logic | | (510) 440-9080 | |
| | | (510) 623-8300 | |
| Colorgraphic | (404) 455-3921 | | |
| Compaq Computer | (800) 345-1518 | | |
| Diamond | (409) 736-2000 | 2400 BPS: | (408) 773-8000 |
| | | (408) 730-1100 | |
| | | 9600 BPS: | |
| | | (408) 730-9301 | |
| Everex | (510) 498-1111 | | |
| Hercules Computer Technology | Tech Support: | (510) 623-7449 | |
| | (510) 623-6050 | (510) 623-7142 | |
| | | (510) 623-7034 | |
| IBM | (800) 426-3333 | | |
| Infotronic SPA | (512) 345-9646 | | (512) 345-9895 |
| Metheus | (800) 6384387 | | |
| Number Nine | (617) 674-0009 | | |
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| | | (800) 959-7274 | |
| Always Technology | | (818) 597-1400 | |
| ATT/GIS (Formerly NCR) | (800) 225-5627 | | |
| BusLogic | | (408) 492-1984 | |
| Ciprico | (800) 727-4669 | | |
| Compaq Computer | (800) 345-1518 | | |
| Dell Computer Corp. | (512) 338-4400 | | |
| Distributed Processing Technology (DPT) | (407) 831-6432 | | |
| Future Domain | | (714) 253-0432 | |
| IBM | (800) 426-3333 | | |
| Mylex | | (510) 793-3491 | |
| | | (800) 776-9539 | |
| Procom Technology | (800) 800-8600 | | |
| Trantor | (see Adaptec) | | |
| **CD-ROM Drive Vendors:** | | | |
| ASM | (800) 992-0120 | | |
| CD Technology | (408) 752-8500 | | |
| Chinon | (800) 441-0222 | | |
| Compaq Computer | (800) 345-1518 | | |
| Creative Labs | | (405) 742-6660 | |
| IBM | (800) 426-3333 | | |
| Mitsumi | (408) 970-9699 | | |
| Panasonic | (800) 742-8086 | | |
| Philips/LMSI | (800) 777-5674 | | |
| Procom Technologies | (800) 800-8600 | | |
| Sony Corp. of America | | (408) 955-5107 | |
| **Miscellaneous Storage Vendors:** | | | |
| ADPI | (800) 758-1041 | | |
| Cheyenne | (516) 484-5110 | | |
| Core International Inc. | (407) 997-6055 | | |
| IBM | (800) 426-3333 | | |
| Integra Technologies | (408) 980-1371 | | |
| Iomega | | (801) 392-9819 | |
| Pro-Engineering | (613) 738-3864 | | |
| Quantum | (800) 624-5545 | | |
| SyQuest | (800) 245-2278 | | |
| **Pointing Device Vendors:** | | | |
| AT&T/GIS | (800) 225-5627 | | |
| Digital Equipment (DEC) | (800) 344-4825 | | |

put the driver disk in your *a:* drive, and the rest is automatic. When the driver installation is finished, reboot your system for the *config.sys* commands to take effect.

If you get the error message: "Driver Control File Could Not Be Found," you are missing the OS/2 device-driver profile file (*.ddp*). Check the installation instructions or a *readme* file for assistance.

### Where are the Drivers?

No matter how hard IBM tries, it's just impossible to provide all of the device drivers with the operating system. Quite a few are included—approximately 80 percent of the most popular ones. In theory at least, new PC hardware should always include a device-driver disk. Only the manufacturer knows its product well enough to write the enabling software.

But it doesn't always work that way. A case in point: the little ThinkPad 500 notebook computer I'm writing this column on. I bought the computer, OS/2, and the PCMCIA modem from the same company: IBM. So where was the device driver to make the modem work? It didn't come with OS/2, the ThinkPad, or the modem, so I called the IBM support hotline. I learned that I needed to download the modem's device driver from IBM's bulletin board system in Raleigh, NC. That's a good trick if your modem isn't working! Fortunately, I have another computer. The new driver has been installed and all is well.

If you are shopping for new hardware, ask about OS/2 support. If the vendor doesn't ship a device driver with their product, find out if one is available, and where you can find it.

## TABLE 1: Vendors of OS/2-Supported PC Attachments. (cont'd)

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| IBM | 800) 426-3333 | | |
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| Logitech | (800) 231-7717 | | |
| Mouse Systems | (510) 656-1117 | | |
| **Scanner Vendors:** | | | |
| Bell & Howell | (800) 247-3724 | | |
| Fujitsu | (800) 626-4686 | | |
| Hewlett-Packard | (800) 752-0900 | | |
| Howtek | (800) 444-6983 | | |
| IBM | (800) 426-3333 | | |
| Kodak | (800) 243-2555 | | |
| Logitech | (800) 231-7717 | | |
| Polaroid | (800) 225-1618 | | |
| Ricoh | (800) 447-4264 | | |
| Sharp Electronics | (800) 237-4277 | | |
| Terminal Data | (805) 531-3279 | | |
| **OS/2 Multimedia Adapter Vendors:** | | | |
| AITech | (800) 882-8124 | | |
| Arkay Technologies | (603) 425-2149 | | (603) 434-5674 |
| Aztech Systems | | (501) 623-8933 | |
| CEI | (800) 333-5234 | | |
| Creative Labs | (800) 998-5227 | (408) 428-6660 | |
| DSP Solutions | | (415) 494-1621 | |
| IBM | (800) 426-3333 | | |
| Jovian | (510) 651-4823 | | |
| MediaVision | | (510) 770-0527 | |
| | | (800) 348-7116 | |
| New Media Graphics | (800) 288-2207 | | |
| Samsung | (800) 446-0262 | | |
| Sigma Designs | (800) 845-8086 | | |
| **PCMCIA Vendors:** | | | |
| Apex Data | (800) 841-2739 | | |
| Data Race | (800) 329-7223 | | |
| IBM | (800) 426-3333 | | |
| Megahertz | (800) 527-8677 | | |
| **Printer and Plotter Vendors:** | | | |
| AST Research | (800) 876-4278 | | |
| Apple Computer | (800) 776-2333 | | |
| Brother | (800) 276-7746 | | |
| Canon | | (714) 438-3325 | |
| | | (800) 848-4123 | |

### Check the table

The best single source of information is IBM's Personal Computer Manufacturer (PCM) Compatibility Table, which lists all of the computers and related hardware supported by OS/2. It even tells you where to get the drivers you need. Sometimes, an existing device driver can be used with new computers or hardware attachments, especially when the new products are made by the same company or use the same circuit boards or chips.

This table, which is updated monthly, is available electronically on several on-line services and bulletin board systems as a file named *pcmtab.zip*. Download it, unzip it, and look for your hardware in the listing (which is currently 6,600 lines long). In many cases, the drivers listed in the table can be downloaded from the same libraries that offer *pcmtab.zip*.

While we don't have space to print the compatibility table here, we have listed many companies offering OS/2-supported hardware attachments and their telephone or BBS numbers. Call the manufacturer if you have a product that isn't listed in the table.

### IBM support for hardware manufacturers

If the hardware lacks OS/2 support and the vendor wants to provide it, ask them to contact IBM. Services include workshops, a device driver source kit, access to a support BBS, inclusion in the Compatibility Table, use of an OS/2 Compatibility Mark on products, and distribution of the device drivers through various electronic channels.

**RESOURCES:**

**IBM User Support**
IBM National Support Center BBS (919) 517-0001
CompuServe: (IBM OS/2 Support Forum, GO OS2SUP. File Library, IBM Files section)
Prodigy: [JUMP] OS/2 Club, download library.

**International:**
OS/2 BBS - Sydney Australia: (61) 2-241-2466
IBM Austria BBS - Vienna, Austria: (43) 222-21145-6600
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*Dick Conklin is editor-in-chief of* OS/2 Developer, *contributing editor to* OS/2 Magazine *and author of three OS/2 books. He can be reached at CompuServe* 76711,1005 *or Internet* os2mag@vnet.ibm.com.

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| Citizen | (800) 477-4683 |
| Compaq Computer | (800) 345-1518 |
| Dataproducts | (800) 334-3174 |
| Digital Equipment (DEC) | (800) 344-4825 |
| Epson | (800) 289-3776 |
| Hewlett Packard | (800) 752-0900 |
| IBM | (800) 426-3333 |
| Kyocera | (800) 232-6797 |
| NEC | (800) 2242-4632 |
| Okidata | (800) 654-3282 |
| Olivetti | (800) 633-9909 |
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| Qume | (800) 457-4447 |
| Seiko | (800) 888-0817 |
| Star | (800) 447-4700 |
| Texas Instruments | (800) 527-3500 |

| Company: | Phone |
|---|---|
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| Varityper | (800) 631-8134 |
| 3Com | (800) 638-3266 |
| Cabletron Systems | (800) 332-9401 |
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| Intel | (800) 548-4725 |
| Madge Networks | (800) 876-2343 |
| National Semiconductor | (800) 538-8510 |
| NCR Systems Engineering | (800) 225-5627 |
| NEC Information Systems | (800) 222-4632 |
| Network Controls International | (704) 527-4357 |
| Tiara Computer Systems | (800) 638-4272 |
| Thomas Conrad | (800) 332-8683 |
| Ungerman-Bass | (800) 777-4526 |
| Western Digital | (800) 832-4778 |
| Zenith Tech Support | (708) 391-8901 |
| Zenith Data Systems - Groupe Bull | (800) 480-7889 |
| **Tape Software Vendors:** | |
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| ASM | (800) 992-0120 |
| Cheyenne | (516) 484-5110 |
| Arcada (Conner) | (800) 526-6637 |
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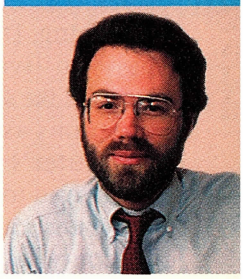
# DOS under OS/2: How does it Work?



**YOU MAY USE IT EVERY DAY, BUT NOW YOU KNOW HOW IT REALLY WORKS** BY MARK MINASI

The unfortunate shortage of OS/2 applications makes it imperative that OS/2 support DOS and Windows. Thankfully, OS/2 does so quite well. But how does OS/2 run DOS programs? Why is it so very difficult to achieve a decent level of DOS compatibility?

One of the hardest parts of supporting DOS programs is defining what it means to be DOS-compatible. Originally, DOS programs were meant to be loaded and supported completely by DOS. DOS included functions that would read data from the keyboard (DOS function **1**), write data to the screen (DOS function **2**), write to the printer (DOS function **5**), open a file (DOS function **3D**), or terminate a program (DOS function 0). DOS acts as a kind of "software arsenal," a toolbox of functions that makes it possible to access the PC's hardware. The programming command to access DOS, by the way, was an 8088 instruction, **INT 21**.

All a DOS programmer has to do is lay out the program's algorithm, defining the parts that DOS's prewritten routines would handle. Other routines would have to be written separately by the programmer. Simple, right?

It was a nice dream, but it never came true. DOS couldn't provide the speed that applications needed. A few programs were written that used DOS hardware support, which the authors of those programs immediately regretted. An early version of the then-popular WordStar program used DOS to put text on the PC screen, which was so slow it looked as if it were putting the characters on the screen with a crayon and the wrong hand.

People didn't use the DOS functionality because IBM and Microsoft didn't practice what they preached. Microsoft's BASICA BASIC interpreter, that shipped with DOS in those days, bypassed DOS's **INT 21** for nearly all of its functions, mainly, again, for reasons of speed. Word got around that even Microsoft didn't follow its own standards (funny how some things never change, isn't it?), so third-party programmers followed suit, bypassing DOS.

Authors didn't use DOS for all their system control and interfacing because DOS isn't complete. It has virtually no serial-port support, and no support for video graphics at all.

Software authors learned quickly that there were better ways to get to the PC's hardware, read the keyboard, or fill up the screen. One way involved directly calling the PC's BIOS routines, like **INT 10** (video functions), **INT 9** (keyboard), and **INT 13** (disk I/O).

Some programmers went even further, writing their own application code that controlled the PC hardware directly, bypassing both DOS and BIOS. The reasons, again, were lack of speed, or support for some piece of hardware—the serial port and graphics are two good examples. Programs communicate with hardware by accessing memory addresses or putting data into a set of addresses known as input/output, or I/O addresses.

Input/output addresses are a new concept for many people, so let's take a moment and look at them. At the lowest level, programs control hardware through these addresses. For example, I/O address **3D9** controls some functions on a video board, and **3F8** controls part of the **COM1** serial port. These addresses—the fact that **3D9** provides video and not mouse support—are vitally important to the PC standard, and in fact, they pretty much are the PC standard.

DOS compatible means three things: for your operating system to run DOS applications, it must completely implement all of the **INT 21** function calls; your operating system must support the 130-plus **BIOS** functions found in the various computers out in the PC world; and the operating system must allow access to a suite of I/O and memory hardware addresses, each with pre-assigned functions.

Now, it's easy to see why DOS compatibility is so difficult for OS/2—or any other operating system, for that matter—to achieve. Providing an **INT 21** is a simple matter, and if all a DOS program

needed to function was that interface, DOS compatibility would be a snap to provide. Beyond that, however, things get sticky. For one thing, DOS programs weren't built to live in a multitasking world. Like spoiled children, DOS programs assume that all of the computer's resources belong to them, and to them only. No other program can run in the same computer as a DOS program, because that program would have no way of keeping the DOS program from tampering with the memory or hardware controlled by the first program. Basically, every DOS program is a whole application and operating system rolled into one.

OS/2 forestalls these conflicts by creating virtual machines. A "virtual" machine is a subset of your PC that uses some of its memory and has limited access to its hardware. Virtual machines are created partly out of hardware, and partly out of software. Their big value is that they keep a DOS program from seeing other programs and those other program's hardware, so conflicts don't occur. The part of OS/2 that keeps track of these things is the virtual machine manager.

Suppose OS/2 is running a DOS program that tries to write data to the screen via the **INT 10** video **BIOS** function. Because it is a DOS application, it doesn't realize that it may be working in the background and not able to write to the screen at that particular moment. If you allowed it to actually perform an **INT 10**, it might write data all over the screen, making a mess of some other program (such as the Workplace Shell).

So, instead, OS/2's virtual machine manager intercepts all **INT 10** calls, which keeps them from actually doing anything. The virtual machine manager picks the **INT 10** request apart and analyzes what the DOS program is trying to accomplish. The virtual machine manager makes a note of that action, so it conceptually has a list that tells it to "clear the screen, put the cursor in the upper right hand corner, display 'ACME Technology Payroll' on the first line, move the cursor to...," and so on. Each **INT 10** call from the DOS program is answered by OS/2 with an "okay" response, which tricks the DOS program into thinking it is, indeed, running under DOS. When the DOS program is actually allowed to move into the foreground, the virtual machine manager "catches up" the screen to the point the DOS program thinks the screen is at, so the DOS program can continue.

The virtual machine manager carves out a special part of memory for the DOS program's use, keeping it separate from other programs by using a feature of 386 and later chips called the virtual 8086 mode, or v86 mode. As you may know, DOS programs must live in an address range that starts at zero and doesn't exceed 1,024K-1. The v86 mode allows OS/2 to take a range of memory—4,000K to 5,000K, for example—and make it look, to the DOS program, as if it is the PC's memory from zero K to 1,000K. The 386's ability to seemingly change the address of blocks of memory at will with software commands is called page mapping, and, by the way, it is the function that DOS memory managers hinge upon—without this ability, there could be no 386Max, EMM386, or QEMM.

So, you see OS/2 is able to shield itself from the poking and prying of a DOS program into places in memory using the v86 mode. However, how does OS/2 keep a DOS program from directly controlling other hardware? How, for example, would OS/2 keep a DOS program from changing the background color of the video screen? In some cases, shielding the hardware from the DOS program is simple, as the DOS program uses **INT 21** or **INT 10** to access the video screen. But a program that accesses video at a lower level would simply access I/O address **3D9**. What would we do about that?

Fortunately, the v86 mode can help with this problem as well. It allows OS/2 to actually assign little programs to i/o addresses—programs that simulate the behavior of the hardware. These programs are called virtual DOS device drivers, or VDDDs. VDDDs can be simple or complex to write. For example, a video VDDD would have to (as I described earlier) deflect commands to change the state of the video board and note them so the commands could be executed later, when the DOS program is in the foreground. An example of a very simple VDDD is the keyboard VDDD. Basically, all it does is answer the question posed by the DOS program, "is there a keystroke in the buffer for me?" If the DOS program is in the background, all the VDDD has to do is answer "no." If the DOS program is in the foreground, all the VDDD has to do is pass through any keystrokes.

The OS/2 virtual machine manager faces its toughest challenges at the lowest levels. DOS and BIOS calls are relatively easy to manage, and attempts by DOS programs to modify hardware states are intercepted by VDDDs. It's a neat solution to a thorny problem. Basically, a virtual machine manager lets you build imaginary PCs out of just about any kind you like.

---

*Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for* Compute, BYTE, *and* OS/2 Magazine. *You can contact him at CompuServe* 71571,264 *or Internet* mminasi@access.digex.net.

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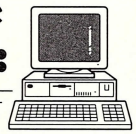

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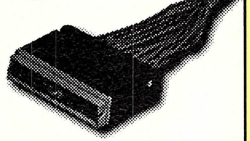

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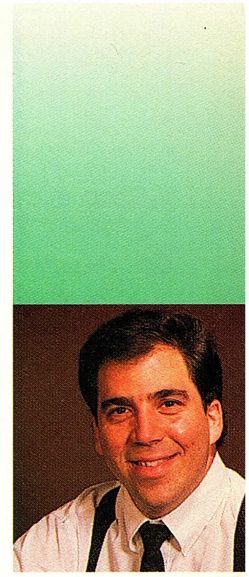

# The Left-handed Mouse

**READER WRITE-INS, OS/2 SERVICE RELEASES, CD-ROM SERVICES, AND MORE...** BY DAVID REICH

## MULTI-LINE OBJECT NAMES

In the May issue ("Tips & Tricks," p. 82), in your response to a question regarding multi-line object names, you indicated that pressing <Alt+Right+Mouse> on the name, then pressing <Enter>, adds line breaks. However, it might be worth noting that if the <Enter> key on the numeric keypad is used, the name edit is terminated without adding a line break.

## LEFT-HANDED MOUSE

**Q:** This may seem like a simple question, but I'm left-handed. How can I use OS/2 with a mouse?

**A:** Move the mouse to the other side of the desk. (Just kidding). There is a setting to swap the left and right mouse buttons for left-handed users. The OS/2 default setting is for right-handed users, but you can open the System Setup folder (which is inside the OS/2 System folder) and open the Mouse object by double clicking with the left mouse button. Once in the Mouse object, you can use the left button to select the Setup page, and select "Left-Handed." Once you close the settings notebook, the swap becomes effective.

**If you purchased a copy of OS/2 2.11 in the box, you have the same code as OS/2 2.1 plus the Service Pak.**

## OS/2 2.11 VERSUS SERVICE PAK

**Q:** What are the differences between OS/2 2.11 and the OS/2 Service Pak?

**A:** OS/2 2.11, is essentially no different from the OS/2 2.1 Service Pak. The code that ends up on your hard disk is identical, no matter which one you use. The difference is how the code gets to the hard disk.

The OS/2 2.1 Service Pak is available to licensed users of OS/2 2.1. In effect, it upgrades you to OS/2 2.11, a maintenance (as opposed to new functional) release. You install by booting from the Service Pak disks, or by inserting disk number one into the disk drive, and typing: **a:service** and pressing <Enter>. Either method will tell the OS/2 fix-tool to install the new code.

If you purchased a copy of OS/2 2.11 in the box, you have the same code as OS/2 2.1 plus the Service Pak. You will install it as a fresh installation of OS/2, choosing to format the partition if you like, and so on. That option, for example, is not available when installing the Service Pak. The operating system that ends up on your hard disk, however, is identical.

## OS/2 FOR WINDOWS SERVICE PAK

**Q:** What is the story on the OS/2 for Windows Service Pak? Is a full-pack version available like the one IBM created for OS/2 2.11?

**A:** The OS/2 for Windows Service Pak is virtually identical to the OS/2 full-pack Service Pak, but with the OS/2 for Windows-specific changes. The fix level is the same.

There is no "refresh" package for OS/2 for Windows. Unlike OS/2 2.11, no shrink-wrapped package exists that will enable you to install a fresh system with the service level. To get to the service level on OS/2 for Windows, you must first install the package, then the service release.

## ADAPTEC SCSI

**Q: I recently acquired an Adaptec SCSI host adapter model 1510. I would like to use it with my OS/2 system, but would like to know if I already have the proper drivers, or if I will need to download them? If so, from where? I want to run a Wangtek tape backup, NEC triple-spin CD-ROM, and a hard disk (eventually).**

**A:** The *aha152x.add* driver that comes with OS/2 is the right one to use with the Adaptec 1510. When installing OS/2 (or when adding features through the Selective Install object inside the System Setup object), you can install this adapter support by specifying the Adaptec 1510, 1520, 1522 entry for the SCSI support.

If you have any trouble with the driver that comes with your OS/2 package, you can obtain the latest driver from CompuServe in the OS2sup forum. The file name is *aha152.zip*.

In addition, it may be that your NEC CD-ROM needs an additional parameter in the *config.sys* file. If you are experiencing problems with any device attached to the adapter (especially the CD-ROM ), try adding **/!sn** to the end of the line in *config.sys*, so it reads:

```
BASEDEV=AHA152X.ADD /!SN
```

## VIEWING ON-LINE HELP

**Q: Sometimes I can't get the *view.exe* program to find my *.inf* files unless I invoke VIEW from the current directory.**

**A:** *View.exe* is the program provided by OS/2 to read the on-line help files shipped with OS/2 or other products. The OS/2 base operating system help and documentation files are installed into the *\os2\book* subdirectory on the boot drive. The way VIEW finds *.inf* files is through an environment variable setting.

Sometimes I can't get the *view.exe* program to find my *.inf* files.

Environment variable settings can be set in the *config.sys* file and/or can be set or changed dynamically from a windowed or full-screen OS/2 command prompt.

When you install OS/2, the on-line files are placed in the *\os2\book* subdirectory, and the BOOKSHELF environment is set accordingly. Other applications, LAN Server or Requester for example, add entries to the BOOKSHELF environment variable so that *view.exe* can find their *.inf* files.

If you have *.inf* files that you want to install, you have several options. You can copy all your *.inf* files to the *\os2\book* subdirectory. Another alternative is to add your subdirectory to the BOOKSHELF environment variable in *config.sys* (you'll have to reboot for the changes to take effect). Or, you could simply modify the BOOKSHELF variable for the command-line session you are running (but remember the change is for that session only). Finally, you could just invoke *view.exe* from the subdirectory in which your *.inf* files reside.

Before installing *.inf* files, you should think about how you plan to access these files in the future. If it is a one-time access, invoking *view.exe* from the subdirectory, where you keep the files, is probably the best choice. If you are installing files to be accessed in the future, you may want to look into *config.sys* environment variable-modification.

## SERVICE FROM CD-ROM

**Q: I am having difficulty installing the Service Pak from a CD-ROM. This, in itself, isn't unusual. The set os2_shell line of *config.sys* (on disk two) did not require alteration, as the CD-ROM drive is indeed *e:*, and the line reads:**

```
set os2_shell=fservice
/S:E:\FIXES\OS2CD\OS21
```

**but the installation process hangs up on disk two. I get a message saying that a MSG file cannot be found, and I get a full-screen message to the effect that the directory, *e:\fixes\os2cd\os21* can't be found or is invalid, and the process goes no further. But I have no trouble finding it if I execute a dir command for this directory on drive *e:*—it even lists the files in the directory.**

**A:** From your description of the problem, it appears that you may have a CD-ROM drive that is supported by a third-party driver that's not included on the IBM-supplied CD-ROM boot (kicker) disks. If you originally installed from your CD-ROM drive and you added the driver to disk two with the appropriate driver statement in *config.sys* on the same disk, then you will have to repeat the same process with your Service Pak CD-ROM kicker disks. If you didn't install OS/2 from CD-ROM, you will need to take the driver file that is currently enabling you to use your CD-ROM drive, copy it to the Service Pak kicker disks. and update the *config.sys* file with the appropriate *.add* file for the CD-ROM support.

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Once that is done, you should be able to install the Service Pak from CD-ROM.

## ICON SHADOW TEXT COLOR

**Q:** I've been able to figure out how to change just about every font and object color on the desktop except for the object text color for shadows of objects. How do I change the color for shadow text?

**A:** In the current release of OS/2, the only way to change the shadow object text color is to use the Scheme Palette. Open the Scheme Palette object that resides inside the System Setup object. You can then edit a palette to suit your tastes and change the shadow object text color in that palette. You can drag that palette to a particular window or folder or use the <Alt> key while dragging to make the change system-wide.

## MISTAKEN IDENTITY

**Q:** I tried to "shred" a program object created by copying the program object in the Templates folder but was unsuccessful. I moved the copy to the desktop but found that I could not do it there either.

Someone suggested that I place the object in a folder and try shredding the folder. I received an error message indicating that the program object could not be deleted because it was either a program object or a shadow. The next suggestion was to go into an OS/2 Window and, at the prompt, go into that folder's subdirectory and delete the file. No files were listed after I entered the dir command. I then moved to the parent directory and removed the folder's directory. However, when I exited back to the desktop, both that folder and the program object were still there. The last thing I tried was to go into the DOS prompt and delete the executables reference by the program object, but this approach did not work either.

**A:** Your problem lies in assumptions you made about what you created at the start. From your description, it appears that you did not copy a program reference object, but actually created a new program object template.

A template is to be used to drag (or rip) off new objects from this template to create new instances of the object—in this case, program reference objects. Templates, unlike many other classes of objects, have an attribute that does not allow you to delete or shred them. There lies the root of your problem. You should use templates to create new objects, but you don't need to copy the template.

Now, how do you get rid of unwanted or redundant templates (or any undeletable objects)? You can use any number of purchasable or shareware programs, such as DeskMan/2 from Development Technologies, or the "black hole" programs (*blackh.zip* or *blckh3.zip*) from an on-line service, such as CompuServe. OS/2 was designed so that it is possible to create Workplace Shell objects that are difficult (or next to impossible) to delete.

---

*David Reich, a contributing editor to* OS/2 Magazine *and author of* Designing OS/2 Applications, *has been with the OS/2 development team since 1987. David is interested in your questions and suggestions. Contact him at CompuServe* 76711,632 *or Internet* speedracer@vnet.ibm.com.

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*Unleashed* CD-ROM does provide the book's REXX source code examples in machine-readable form, but most of the CD-ROM is devoted to material not found in the book.

Traditionally (if we can use that word for relatively recent events), computer-book publishers have simply shoved a floppy in the end papers, offering relevant oddments of source code and shareware. The vulnerable 5¼-inch format, however, was a disaster, universally hated by booksellers forced to act as intercessories in damaged-floppy disputes. The sturdier 3½-inch disk increased book-shelf-life, but a new problem has emerged: capacity! Welcome to the 5MB "hello, world" with resizable, animated, rictus grins. Even with compression, the near-universal 1.44MB format is proving inadequate, and until recently, PC archiving utilities couldn't zip large files across multiple volumes. In any case, a book with several disks is hard to package.

May I digress to tell a bizarre but true tale? Recently, a client sent me a single, huge Help file pkzipped onto six disks, clearly labeled one through six. The accompanying note explained that I should pkunzip them in reverse order, an apparent quirk of this multi-volume compression method. After several abortive attempts at decompression, I called the sender only to discover that, due to internal miscommunications, someone had already, helpfully, reversed the numbering on the disk labels.

Until "hello, world" becomes a Frank Capra movie, the 680MB CD-ROM should handle the capacity problem. (But remember a few years ago we thought 640K was *infinity*!) It can also be hidden safely within the rear covers. (Note that the thicker the book, the safer the embedded CD-ROM.) Here we have yet another proof of Voltaire's "Tout est pour le mieux..." (All is for the best in the best of all possible worlds). Larger books command higher dollars, so the proportional price increase to cover the cost of the CD-ROM is reduced.

More and more software vendors, of course, are distributing their wares via CD-ROM. Indeed, IBM, Borland, and others are offering price inducements in this direction. And, with CD-ROM drive prices falling to a mere $250 to $300 (your Buckeye dinner for four), and sound cards for $200 (your average Porsche oil change), millions of PC owners, myself included, have "gone multimedia." Although, so far, I feel generally ripped off by the diverse so-called entertaining/educating CD-ROMs I have purchased (typically $39.95 each), the redeeming pleasure is avoiding the horrors of a 25-or-more disk installation.

I'm sure Sams did its homework on how many potential *OS/2 Unleashed* readers would be attracted by the "free" CD-ROM offer. It is clearly a dynamic, Catch-22 situation, not unlike that confronting OS/2 itself. The more CD-ROM titles available, the more users tempted to install the hardware, and conversely! Likewise, we see the same interaction between OS/2 applications and the penetration of OS/2.

One irony here is that IBM was rather late in jumping on the multimedia bandwagon. But having now made the move, and exploiting the key multitasking and multithreading advantages of OS/2, its MMPM/2 is looking and sounding good. A substantial chapter in *OS/2 Unleashed*, written by IBM's Linden deCarmo, is devoted to multimedia—both hardware and software. This chapter is the best treatment of MMPM/2 I have encountered. Looking for other areas, outside the usual installation, configuration, Workplace Shell, and REXX programming topics covered adequately by other general OS/2 guides, where *OS/2 Unleashed* stands out, I noted the chapters on Fonts (by David Kerr) and Printing (by Mike Perks, designer of the OS/2 print subsystem). These personally angst-inducing subjects are now almost completely demystified.

Comparing Sams' *OS/2 Unleashed* at $39.95, including the CD-ROM, with QUE's Using OS/2 (reviewed here last month, August 1994, pp. 78-80) that comes sans CD-ROM for $34.99, you can see that Sams has unleashed a real bargain.To my UNIX and Windows colleagues who find the word "unleashed" a tad hyperbolic when applied to OS/2, I say, look at the numbers and the growing native OS/2 applications base.

**RESOURCES:**

**OS/2 2.11 Unleashed, Second Edition, ($39.95)**
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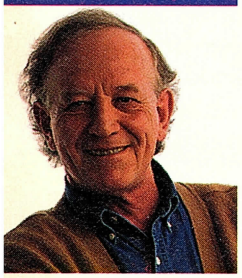
*Stan Kelly-Bootle started computing on EDSAC I at Cambridge over 40 years ago and has written at least 11 books. His "Devil's Advocate" column in* UNIX Review *has been running since 1984. He can be reached on CompuServe at* 70323,1560, *MCI* SKELLY-BOOTLE, *or Internet* skb@crl.com.



# Unleashing OS/2

## INDIANAPOLIS' FAVORITE PUBLISHING HOUSE BRINGS HOME THE GOLD

BY STAN KELLY-BOOTLE

I believe that reviewers should reveal up front any conscious biases that might influence their judgements. For this month's book, *OS/2 Unleashed*, I should immediately confess to having a soft spot for Sams Publishing of Indianapolis. Before they were acquired by Macmillan and thence by the now-late "Cap'n Bob" Maxwell (who is sorely missed by his 10,000 creditors), Howard W. Sams was best known for books revealing the inner secrets of radio and hi-fi circuits. You might say Sams pioneered the "undocumented-features" genre now widely exploited in the Microsoft DOS and Windows environments. I was one of Sams' first computer-book authors in the 1980s with three potboilers on 68000 assembly language and Modula-2 (whatever became of Modula-2? Ould Nick Wirth lost interest and so did I). I found the Sams' crowd home-town friendly (Indiana *invented* bonhomie) compared with the more corporate-formal New Yorkers I met when writing for McGraw-Hill in the late 1970s. I've since moved my authorshipping to Sybex and MIT Press, but I sense that Sams has retained its amiable ambience in spite of an enveloping publishing conglomerate that subsumes former competitors, such as Prentice Hall, Brady, Hayden, New Riders, Adobe Press, Alpha Books, and QUE.

Sams' second edition of the popular *OS/2 Unleashed* is undoubtedly an impressive achievement. Much enhanced for OS/2 2.11 and OS/2 for Windows, it now runs to 1,332 pages and weighs in at over two kilos. At $39.95, it represents great value per word, per tip, and per gram. Add in the CD-ROM that is included at no extra charge, and the bundle quickly moves ahead of its many rivals.

**I was tempted to review *OS/2 Unleashed* as a CD-ROM with an attached book, instead of as a book with an attached CD-ROM.**

Although it lacks the latest Otabinding (the lay-flat spine technique invented by Otava, Finland in the 1980s), *OS/2 Unleashed*, in spite of its considerable avoirdupois, sits well on the desk and remains open at the selected page. In fact, during some cluttered moments, I found myself using it as a back-up mouse-pad.

As you might guess, this wide-ranging work is the cooperative effort of many experts, 13 in fact, ranging from key members of the IBM OS/2 programming team to respected OS/2 consultants and developers. David Moskowitz, President of Productivity Solutions, and David Kerr, of IBM's OS/2 Development Team, provided the integrative editorial glue. David and Rosemary Moskowitz, by the way, edit two newsletters for OS/2 enthusiasts.

The *OS/2 Unleashed* CD-ROM contains a rich mother lode of OS/2 code: commercial applications and demos, IBM EWS (Employee Written Software), REXX source code, and a staggering OS/2 BBS database (it seems that only Rwanda and Uzbekistan lack, as we go to press, an OS/2 Users' Group). It takes 35 pages just to list the CD-ROM contents. Indeed, I was tempted to review *OS/2 Unleashed* as a CD-ROM with an attached book, instead of as a book with an attached CD-ROM.

The decision to include a CD-ROM instead of ho-hum disks is quite exciting. My prior exposure to the Book-with-CD-ROM market has been limited to lexicography (the Oxford English and Random House Unabridged Dictionaries). This context, though, is completely different since the dictionary CD-ROMs encode the bulk of the printed text with extra features for searching, browsing, cutting and pasting, and so on. The *OS/2*

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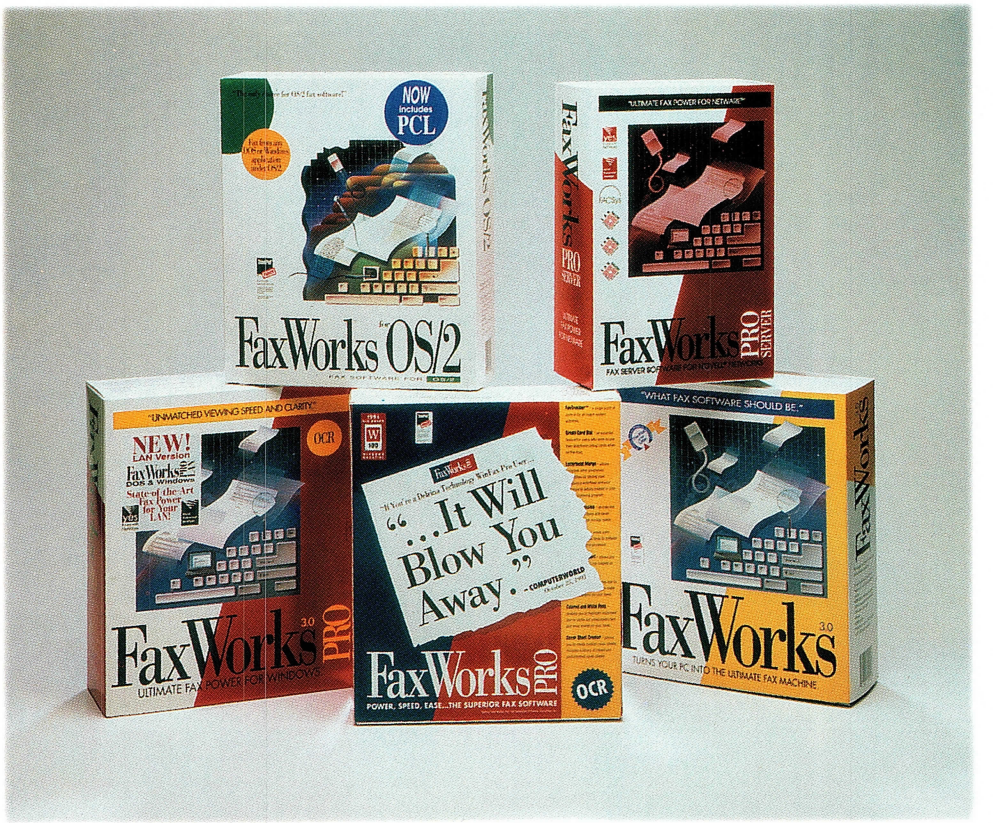


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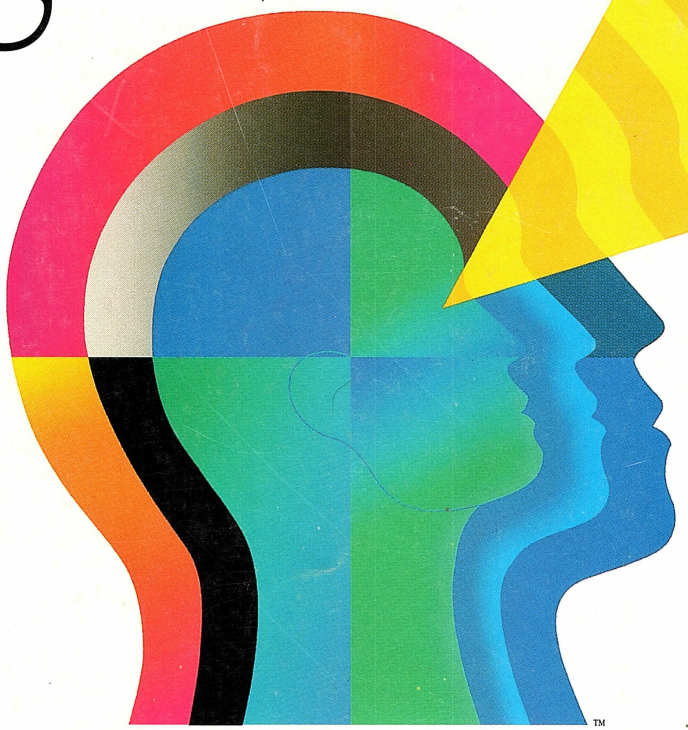

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